STRESS AND COPING IN UNIVERSITY EMPLOYEES: A LONGITUDINAL EVALUATION OF STRESS, PERSONALITY, COPING AND PSYCHOLOGICAL DISTRESS

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I state this is all my work

Abstract

Background: Internationally, high levels of stress and Psychological Distress have been identified in university employees. There have been calls to investigate stress over time and to include measures of coping and personality. This study provides the first longitudinal assessment of stress and Psychological Distress and examines the role of personality and coping in university employees during campus relocation

Method: All 500 employees in Queen Margaret University were invited to complete standardised measures assessing Psychological Distress and sources of stress (HSE Indicator Tool) before (N = 143) and after relocation (N = 116). Participants also completed measures assessing Job Satisfaction, Personality, Coping and additional demographic information.

Findings: High levels of Psychological Distress were identified before relocation (42%) and at 6 months (38%). Academic staff had a higher prevalence of Distress following relocation. Matched pair analyses (N = 48) showed the majority of stress sources remained stable from T1 to T2 with one significant decrease in reported levels of Control. Stressors explained 31.8% of the variance in Psychological Distress even when the effects of pre-specified variables (Neuroticism, Coping and age) were controlled. Employees with higher levels of Neuroticism and Emotion focused coping had significantly higher levels of Psychological Distress.

Discussion and conclusions: Psychological Distress was higher than in population norms and other occupational groups. The primary stressors were identified and targets (based on national benchmarks) suggested. On-going monitoring and actions aimed at reducing stress and improving Psychological Distress are warranted. This is one of the first studies to assess the relationship between the management standards (indicated by the HSE Indicator tool) and stress outcome, and to use a matched participant design to assess change in the management standards. That the Management standards predict Psychological Distress lends support to the use of the management standards approach.

Acknowledgements

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Note on the presentation of this thesis: Many of the displays in this thesis are presented in colour. The author experimented with a variety of formats regarding structure and format. Multiple opinions were sought prior to finalizing the visual presentation of the thesis. The use of colour and graphic design was deliberately chosen to break text, facilitate readability and assist the reader in assimilating information.

Capitalisation is used to differentiate measured constructs [for example, Psychological Distress as measured by the GHQ12) versus the general term (psychological distress)]. Measured factors are capitalised (e.g. *N*euroticism instead of neuroticism). Lower casing is used primarily in the introduction.

1 INTRODUCTION

1.1 Overview

Stress in the workplace and its impact on employee psychological distress is a significant problem. There were 428,000 cases of work related illness in Britain in 2011 / 2012, and this represents 40% of all work related illness [Health Service Executive (HSE), 2013a]. In 2008/9 11.4 million working days were lost due to stress, depression, or anxiety (HSE, 2009).

This research assesses stress and psychological distress in Queen Margaret University (QMU) employees. Several factors highlight the case for on-going research assessing stress in University employees.

Firstly, the negative impact of stress has been demonstrated as severe for the individual, the organisation, and for broader society. For University employees research has identified a corresponding decreased physical (Boscolo et al., 2009; Kamarch et al., 2012) and mental (Winefield et al., 2002) well-being. Stress has been associated with increased likelihood of cardiovascular disease (Esler, Shwars & Avarenga, 2008) and multiple immunological disorders (Naliboff et al., 2004; Cohen, Miller, & Rabin, 2001). For the organisation this negative impact includes increased absenteeism (Jacobson et al., 1996; Jones, Huxtable, Hodgson & Price, 2003), lost productivity (Levi, 1996), increased risk of work-related injuries and accidents at work (Spielberger, Vagg, & Wassala, 2003) and stress related claims for compensation (Guthrie, Ciccarelli, & Babic, 2010). The estimated costs of work-related stress to society are £3.7 billion in the UK (HSE, 2004).

Secondly, the university sector is at high risk with research demonstrating a high level of stress and distress in University employees when compared to other occupations and to the general population (Biron, Ivers, Brun, 2008; Kinman & Court, 2010).

Thirdly, legislation requires the assessment of risk and corresponding action. The identification and management of stress is indicated by legislation in the United Kingdom which outlines the employer responsibility to assess potential risks to their employees. One of the first steps in stress management and prevention is assessment and the HSE have published management standards to assist this process.

This research is both a stress audit and a distinct piece of research. Its primary function is to assess stress and distress in Queen Margaret University (QMU). It comprises an audit in order to measure and describe levels of stress and distress and compares findings with those from other occupations in the UK. It is important for the University in that it will:

1 Assess a potential risk identified in the literature (stress) at a time of change (campus relocation).

2 Provide short, medium, and long term targets for improvement based on the findings.

3 Identify strategies for developing stress management interventions based on the results.

This research serves several other functions and seeks to address gaps in the literature. Within the stress literature there is a paucity of longitudinal assessment (Kerr, McHugh, & Mcrory, 2009). This research provides the first longitudinal assessment

of stress and distress and examines the role of personality and coping in university employees. Stress is conceptualised as the independent variable and refers to recognised sources of occupational stress including low levels of control, poor relationships, and lack of support, unclear roles and change. Distress is conceptualised as the dependent variable and refers to a negative state of mental ill-health, whereby sleeping patterns, concentration abilities, self-esteem, depression, and confidence are negatively impacted.

Understanding the individual characteristics that are related to more or less distress can lead to targeted interventions to reduce stress and improve employee (and organisational) well-being. Ultimately the end goal of this research is to provide an evidence base that can inform the design and implementation of interventions.

This study uses the HSE management standards approach to identifying work-related stress. It is one of the first studies to a) assess the relationship between the management standards and outcome and b) to use a matched design to assess change in the management standards.

In summary, this research is unique in that:

- It is longitudinal
- It uses the HSE framework and assesses relationship with outcome
- It uses measures of personality and coping

This study was conducted recognising of the role of Health Psychology in contributing to improved understanding of employee health and well-being. Health

psychology has established that psychosocial factors have a significant role in the aetiology of stress; distress and stress, health, and illness are core topics within the discipline (Ogden, 2004). A key question that Health Psychology asks and seeks to answer is: what causes stress? How can we understand the link between stress and illness? This thesis asks these questions. At its core it seeks to identify and understand the psychosocial factors involved in stress and distress. It also reviews and presents the evidence for these factors.

Explicit and general theoretical frameworks from Health Psychology underpin this study (e.g. section 1.9, p.60). While the findings are pertinent across different disciplines, we also review the implications for Health Psychology (Section 4. 18, p. 179).

This study is unusual for occupational stress research in that in addition to examining stress, distress, and individual factors, it also seeks to understand health related behaviours in this group (such as exercise, counselling and therapy usage, and alternative/complementary medicine usage).

An additional question frequently asked within the discipline of Health Psychology is what factors can mitigate stress and illness. This thesis also poses this question and conducts a comprehensive systematic review of the literature on the effectiveness of interventions in improving psychosocial health in university employees (see section 1.8.1, p 53-56, and Appendix 24).

The following section places the current research in context. It reviews the literature and provides an overview of key concepts relating to stress and the university sector.

It outlines the legal, business and moral case for assessment and management and suggests the utility of a risk assessment approach to successful stress management. It then reviews the evidence on how stress is measured and managed in Universities.

1.2 Defining Stress

The term stress has been widely adopted into everyday language worldwide and its ubiquity in popular culture is evident. In many cases there appears to be a perception of implied meaning or shared understanding and definitions are often neglected. In fact an implicit knowledge is presumed to such a degree that stress is often not defined [for example in course manuals in the legal professions (Independent Colleges, 2011)]. The scale of its use in everyday language suggests widespread agreement as to a definition.

At a basic level the following quotation by Rice highlights some of the challenges faced when defining the stress concept: "*Stress is somewhat like the illusive concept of love: everyone knows what the term means, but no two people would define it the same way*" (Rice, 1999, p4).

A deeper look highlights the inherent difficulties associated with the term stress and its understanding. Stress research and literature is diverse and extensive, this and debates over the challenges involved in defining stress as well as the utility of such a definition are evident. Several authors (for example, Linden, 2005; Chmiel 2000; Contrada & Baum, 2011) highlight the fact that there is little agreement as to a general definition or corresponding theory of stress. Several factors contribute to the difficulty in agreeing an 'all encompassing' definition including:

1 That there are numerous disciplines involved in Stress research and each is accompanied by varying perspectives such as: Physics, Psychology, Sociology, Biology, Epidemiology etc. (Buunk , de Jonge, Ybema, & de Wolfe, 1998).

2 That the term "Stress" is often used to refer to both the cause and the effect of the stressful situation (Nel & Spies, 2006).

Contrada & Baum (2011, p.1), in their handbook introduction highlight the need for an awareness of the challenges associated with the stress concept and its definition when stating:

> *....it can usefully serve only as a general rubric for a set of loosely related research areas, and that it is ill-suited as a label for any single concept with any one particular technical definition. Others, by contrast, have offered quite narrow, discipline-specific definitions of stress. Still others, pointing to problems with definitions and other sources of dissatisfaction with stress research, have argued that the stress concept should be abandoned.*

Despite the challenges stated above by Contrada & Baum (ibid.), and while agreement on a general definition of stress, or the utility of such a definition, is poor, research and literature relating to stress continues to flourish. Leaders in the field continue to clarify taxonomies for understanding stress (for example, Cox & Griffiths, 2010). Segerstrom & O'Connor (2012) suggest that future research can yield much discovery, particularly in furthering our understanding of how stress, coping, and health develop and change over time.

While specific definitions vary there are commonalities including reference to terms such as 'pressure', 'strain' and 'demand', 'balance' or 'equilibrium', to 'resources' and 'coping'. At a broad general level stress has been classified as a reaction to stimuli in the environment (Ross & Altmaier, 1994, p137) or the reaction to excessive pressures or demand (HSE, 2013b). It is increasingly recognized as a complex and interacting process, differentiated from being dependent solely on an external cause,

and having a physical, psychological and emotional components. Stress is often understood in terms of reactions that occur when internal or external stimuli are too demanding and exceed usual coping mechanisms. This conceptualisation of stress has prevailed in the literature over an extended period as is demonstrated in Table 1, which provides several definitions of stress. In line with these definitions this thesis investigates sources of stress reported by University employees and examines how these are related to psychosocial outcomes, personality and individual coping.

Table 1. Definitions of stress

Source	Definition
HSE website, 2009	The process that arises where work demands of various types and combinations exceed the person's capacity and capability to cope.
HSE, 2008, p.1	Work related stress is the adverse reaction people have to excessive pressures or other types of demand placed on them.
WHO (Leka, Griffiths, & Cox, 2003, p.3)	The response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.
European Foundation for the Improvement of Living and Working Conditions, 2007	Work-related stress is a pattern of reactions that occurs when workers are presented with work demands that are not matched to their knowledge, skills or abilities, and which challenge their ability to cope.
Ross & Altmaier, 1994, p. 12	The interaction of work conditions with characteristics of the worker such that the demands of work exceed the ability of the worker to cope with them.
Le Blanc et al. (in Chmiel, 2005, p. 154)	An experienced incongruence between environmental (job) demands and individual/situational resources that is accompanied by mental, physical, or behavioural symptoms.
Rice, 1999	Anything that leads to a stress response or disrupts the equilibrium of the individual.
Williams, 1994 (in Nel & Spies, 2006, p. 34)	What happens to us when things go wrong. It is something we suffer from and has a negative quality. It has physical, psychological and an emotional component. There does not need to be an external cause and the consequences of being under stress can affect our physical, mental and social health.

1.3 The Impact of Occupational Stress

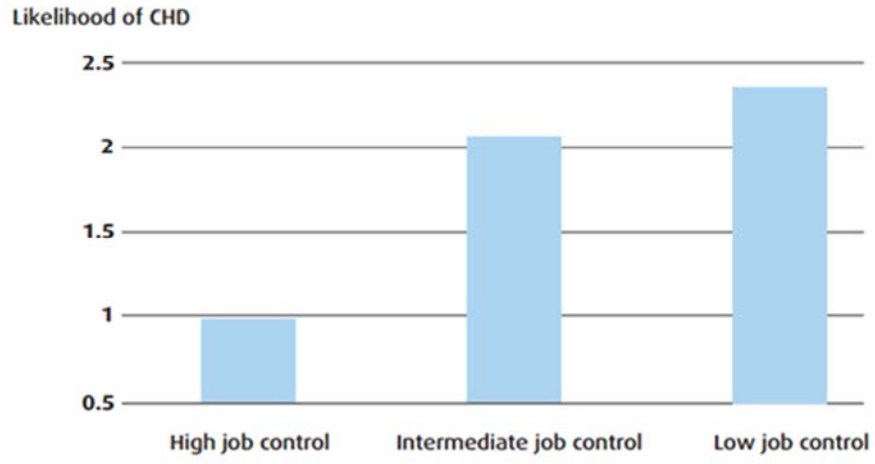
The abundance of research into stress is not surprising given its potential negative impact for individual, organisation and society. This section reviews key findings relating to the impact of workplace stress. These findings in particular have resulted in the recognition of the need for a proactive risk management approach to manage workplace stress in the United Kingdom.

1.3.1 The Physical and psychosocial impact of occupational stress

A large amount of research has shown the physical correlates of stress to be both numerous and severe. Levels of occupational stress have been associated with increased likelihood of cardiovascular disease (Bache et al., 2012; Kamarck et al., 2012; Kivimaki et al., 2006; Byrne & Espnes, 2008; Esler, Shwarz & Alvarenga, 2008), decreased immune response (Segerstom & Miller, 2004; Cohen et al., 1991), poor response to immunisation (Cohen, Miller, & Rabin, 2001), gastrointestinal disorders (Naliboff et al., 2004), a reduction in natural killer cell activity in male university staff (Boscolo et al., 2009) and increased susceptibility to several chronic illnesses (Ogden, 2004; Cox, 1978). Reference to recent reviews further confirm these physical correlates of the stress response (Segerstrom & Miller, 2004; Ulrich-Lai & Herman, 2009; Chida & Hamer, 2008; Steptoe, Hamer & Chida, 2007; Cohen et al., 2001; Kudielka & Kirschbaim, 2004). The physical pathways of the stress response are increasingly understood to involve multiple systems including changes at the physiological, neurochemical, endocrinological, and behavioural levels (Patchev & Patchev, 2006; Chida & Hamer, 2008; Gunar & Quevedo, 2007), for example, the

release of a variety of hormones through the activation of the hypothalamic-pituitary-adrenal-axis (Patchev & Patchev, 2006; Segerstrom & Miller, 2004).

A considerable amount of evidence exists demonstrating the workplace stressors that are associated with poorer mental and physical health. One landmark and on-going epidemiological study that has influenced policy formation in the UK is the Whitehall II study, which followed 10,308 working men and women over ten years. It found that high demands independently predicted ill health and psychiatric disorder and that high levels of control and social support demonstrated a protective effect on functioning. Figure 1 provides a vivid illustration of one particular finding relating to control. It shows that employees with low job control have more than two times the heart disease incidence of those with high job control.



Adjusted for age, sex, length of follow-up, effort/reward imbalance, grade,coronary risk factors and negative affect.

Figure 1. Self-reported job control and coronary heart disease incidence (from Ferrie, 2004)

The study found that support from peers and supervisors was associated with improved mental health and less absence. Figure 2 below shows that poor mental health was found to be considerably more likely in employees with low levels of social support.

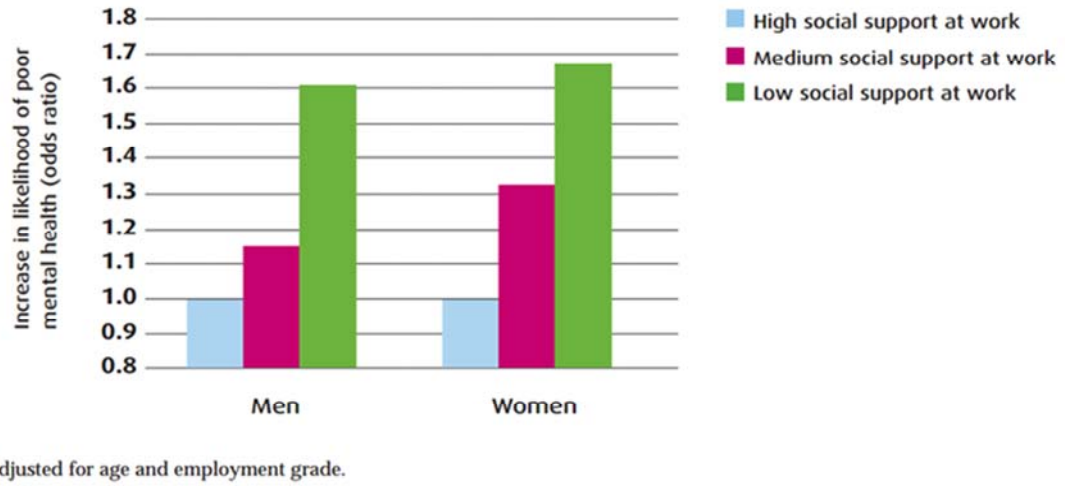


Figure 2. Social support at work as a risk factor for subsequent poor mental health (from Ferrie, 2004).

Participants with low control in their jobs also had more back pain, mental illness, higher absence rates and risk for alcohol dependence. Imbalances between demands and control predicted illness, that is, high levels of demand combined with low control were associated with poorer outcomes. The Whitehall report concluded that "*Work factors are as important as non-work influences on health. Our results suggest that intervention at the level of work design, organisation and management may reduce morbidity in working populations*" (Stansfield, Head, & Marmot, 1999, p. 1).

These findings are supported by what can be considered one of the most prevalent work stress models (De Jonge, Van Vegchel, Shimazu, Schaufeli, & Dormann, 2010), that of Karasek & Theorell's (1990) Job demands-control model, and later the job-demands-

control-support model (Karasek, Triantis, & Chaudhry, 1982; Karasek, 2008). These view strain as resulting when high levels of demands interact with low levels of control or decision latitude. Support for an interaction effect between demands and control has been partially demonstrated in cross-sectional studies. Van der Doef & Maes (1999) reviewed the literature between 1979 and 1997 and found that 30/78 studies supported the interaction model. Hausser, Mojzisch, Niesel, & Hardt (2010) updated the review to include the period between 1998 and 2007 and concluded that evidence for interaction was weak overall. The review identified consistent support for the additive effects of demands, control, and support on psychological distress. These, and epidemiological studies (Stansfield et al., 2000) support Mackay et al.'s (2004) argument that regardless of interaction, "*…demands and control still exert an important influence on (stress) outcomes in their own right*" (2004, p. 98).

The Whitehall 11 findings are also supported by repeated findings demonstrating the importance of social support to stress and health. A lack of social support has been associated with increased depressive symptoms and poorer health (Leifheit-Limson et al., 2010). Studies testing the Person-environment fit model identify the importance of interpersonal relationships, support, and control to psychological distress (Edwards & Rothband, 1999). This model defines stress as resulting from the mismatch between job or environment and individual characteristics (Caplan, 1983, 1987). A discrepancy in goals, values, or beliefs can lead to role stress (ambiguity, role conflict, role overload) and to strained interpersonal relationships.

Social support and interpersonal relationships have seen considerable analysis as potential 'buffers' in the stress distress relationship (Cohen & McKay, 1984).

Employee values or expectations that are aligned with the job environment (such as meeting expectations regarding relationships and autonomy) lead to decreased distress (Edwards & Rothband, 1999). Relationships are identified as important in stress literature in that they can enhance well-being directly and also increase levels of social support (Cohen & Wills, 1985; House, Landis, & Umberson, 1988). Conversely, relationships can have a negative impact on psychological distress. For example, bullying has been found to lead to greater levels of stress, fatigue and to effect the release of stress hormones (Agervold, & Mikkelsen, 2004; Hansen et al., 2006). A knock on effect whereby employees that witness bullying tend to report symptoms of anxiety has also been found (Hansen et al., 2006).

Mackay, Cousins, Kelly, Lee, & McCaig (2004) review how findings from large scale epidemiological studies such as the Whitehall study, in combination with the evidence from other empirical studies, contributed to the current Management standards approach to stress management in the UK. This approach is discussed in more detail in subsequent sections but it involves the measurement of 6 work-related stressors (demands, control, relationships, change, support, and role) that have been shown to be related to poor physical and mental outcomes (Mackay et al., 2004). Additional studies have also supported the relationship between stress and psychological distress (Gyllentsten & Palmer, 2005; Beasley, Thompson, & Davidson, 2003; Winefield et al., 2002; Sauter et al., 1990) and these are reviewed in more detail in the section discussing the university context.

1.3.2 The societal and organisational impact of occupational stress

While stress has traditionally been examined from an individual perspective its economic and social cost to broader systems has become increasingly evident. In addition to the individual physical and psychological risk, there is a broader risk related to employee absenteeism (Jacobson et al., 1996; Jones, Huxtable, Hodgson & Price, 2003), lost productivity (Levi & Lunde-Jensen, 1996), increased risk of work-related injuries and accidents at work (Spielberger et al., 2003), near misses (Kerr, McHugh, & McCrory, 2009) and stress related claims for compensation (Guthrie, Ciccarelli, & Babic, 2010). In the University of Aberdeen sickness absence cost the university £1.64 million in 2009, of which 10.4% (.69 days per person) of absences were due to stress / anxiety (Robertson, 2011).

Estimated costs of work-related stress to society were £3.7 billion in the UK (HSE, 2004) and in 2010/11 the total number of stress cases was 428, 000 (HSE, 2011). Some calculations have estimated a cost of between £1,200 and €1,155 per person in employment (European Commission, 1999).

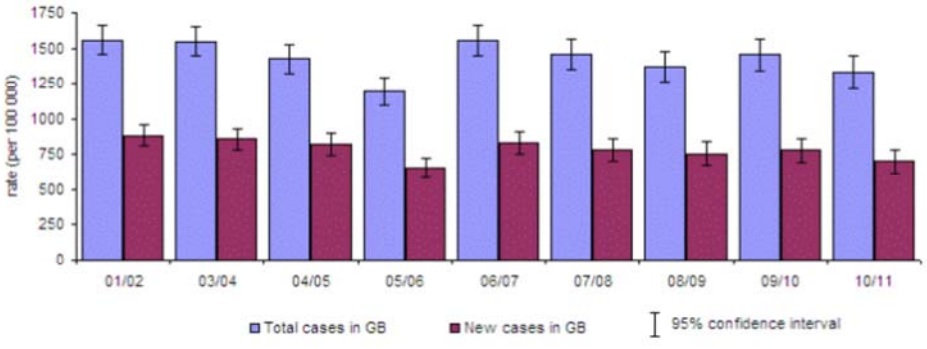


Figure 3. Total number of cases (prevalence) and new cases (incidence) of work-related stress in the Great Britain 2001/02-2010/11 (from HSE, 2011).

1.4 Stress Reactions

It is necessary to distinguish stress at work from the concepts of 'pressure' or 'challenge' which are viewed as necessary or unavoidable components of the modern work environment (WHO, 2003; HSE, 2009a). A certain amount of pressure may challenge and motivate, promote learning and productivity and improve performance. Pressure that is perceived as excessive without adequate recovery and that exceeds coping resources is likely to result in stress and accompanying stress reactions.

These reactions or symptoms of stress can be physical or psychological and can be described at the level of individual, organisation and in terms of interpersonal interactions with / within the organisation. Within each of these levels, the symptoms of stress can be classified according to physical or psychological reactions (Affective; Cognitive; Physical; Behavioural; Motivational).

Table 2 provides examples of specific implications for the individual and organisation. It should be noted that increasingly these categories are viewed as transactional, such that change in any area can impact or feedback to another. For example, increases in workload for the newly promoted employee may lead to initial negative cognitive appraisals (feelings of uncontrollability, lack of resources,) which leads to affective (burnout, strain, anxiety) and behavioural (disrupted sleep, increased stimulants, less exercise) aspects. These may overspill into family life which may then lead to further or accentuated affective aspects in work (irritability, impacted self-efficacy beliefs). If the situation persists, deterioration in work performance and physical symptoms (headache, gastrointestinal problems) may lead to sick leave or turnover.

This transactional viewpoint builds on structural interactional models by emphasising cognitive and emotional processes (such as appraisal and coping). In practice it is likely that occupational stress involves multiple interacting outcomes and that stress symptoms may operate in a cascading manner (Segerstrom & O'Connor, 2012), that is, one stressor can lead to additional stress or change an individual's subsequent reaction or resilience, coping responses etc.

Any category of individual and interpersonal stress symptoms has the potential to impact the work atmosphere, including the quality of team-working and work relationships. Similarly, occupational stress symptoms are unlikely to work in isolation of other life aspects.

Table 2. Possible stress symptoms at the individual, interpersonal and organisational levels

	Individual	**Interpersonal**	**Organisational**
Affective	Anxiety Tension Anger Depressed mood Apathy Burnout / strain / exhaustion / fatigue / low vigour/ / spill-over into family life	Irritability Oversensitivity	Job dissatisfaction Impacted work atmosphere / team-working / relationships
Cognitive	Helplessness Cognitive impairments Difficulties in decision making Impacted confidence and self-efficacy	Hostility Suspicion Projection	Cynicism about work role Not feeling appreciated Distrust in peers, supervisors and management
Physical	Physical distress (including muscle tension, headache, nausea, gastrointestinal problems, coronary heart disease, impaired immune response); physical exhaustion		

	Individual	Interpersonal	Organisational
Behavioural	Hyperactivity Impulsivity Increased consumption of stimulants (caffeine, tobacco) and illicit drugs Over and under-eating Disrupted sleep	Violent outbursts Aggressive behaviour Interpersonal conflicts Social isolation / withdrawal Aggressive behaviour	Poor work performance Declined productivity Tardiness Turnover Increased sick leave Poor time management
Motivational	Loss of enthusiasm Disillusionment Disappointment Boredom Demoralisation	Loss of interest in others Indifference Discouragement	Loss of motivation Resistance to go to work Dampening of work initiative Low morale

Adapted from Le Blanc, de Jonge and Schaufeli, 2000, p. 156

There are many commonly agreed stressful events. The general stress literature provides a considerable account, or contextualises these potential stressors (Theorell & Rahe, 1971). One landmark study by Homes and Rahe (1987) identified and ranked stressful life events in the Social Readjustment Scale according to their relationship with illness (Table 3 below). These ranged in severity from 'death of a spouse' to more minor events such as 'vacation' or moving house. Life events were found to correlate with health status and lead to serious risk of illness (>300), moderate risk (150-200), and light risk (<150).

Table 3 Sample items from The Social Readjustment Scale

Life event	Score	Life event	Score	Life event	Score
Death of a spouse	100	Dismissal from work	47	Change in social activities	18
Divorce	73	Marital reconciliation	45	Minor mortgage or loan	17

Life event	Score	Life event	Score	Life event	Score
Marital separation	65	Retirement	45	Change in sleeping habits	16
Imprisonment	63	Change in health of family member	44	Change in eating habits	15
Death of a close family member	53	Pregnancy	40	Vacation	13
Personal injury or illness	50	Trouble with in-laws	29	Christmas	12
Marriage	47	Gain a new family member	39	Change in residence	20

It is clear that other life events have an impact on stress and health. Another approach that has contextualised some of these other stressful events is work-family carry over (Elliot, 2008; Lee et al., 2010). Here, roles and responsibilities from work are thought to impact family life and vice versa. Similarly, conditions associated with each are important (working flexibility, travel time, working hours, childcare policy etc.) and can have positive or negative implications.

We review a variety of potential stressors specific to the occupational stress literature throughout this thesis. While events may be stressful it is important to recognise the difference between acute events and chronic stressors and the importance of individual factors. Any event can be potentially stressful, and something that is stressful for one person may not be stressful for another.

1.5 Changes in models and broader taxonomies of stress

The stress literature is extensive. Table 3 highlights some of the key features of models of stress that have developed since the early 1900s. These have differed and evolved according to stress definition, emphasis on biological or psychological factors, and in terms of how they conceptualize the individual's interaction with the environment. In Table 4 we see that earlier models (for example, Seyle, 1956; Cannon, 1932; Pavlov, 1927) tended to take a simplistic cause and effect approach whereby an external stimulus created a response. These tended to emphasise biological factors in the stress process and neglect socio-cognitive inputs. Latter models such as social stress theory (Slavin, Rainer, McCreary, & Gouda, 1991) and transactional theory (Lazarus & Folkman, 1984), created more of a role for environmental and individual and cognitive factors.

Table 4. Comparison of key features of models of stress (adapted from Rice 2000)

Model	Related Theorists	Definition of Stress	Source (s) of Stress	Model Strengths	Model Weaknesses
Fight or Flight model General Adaptation Syndrome	Cannon (1932) Seyle (1956;74;79)	Non-specific demand on body-disturbs equilibrium.	Various environmental pressures-chronic-depletes energy reserves.	Empirically derived and extensively tested.	Extreme biological emphasis. Treats good and bad stressors in the same way.
Diathesis-stress model	Parsons (1988)	No specific definition provided.	Mismatch between biological endowment and environmental stressors.	Interaction model. Gives equal weight to internal and external factors.	Ignores cognitive-social factors in stress. Indirect evidence rather than direct tests. Difficult to give terms operational reference.

Model	Related Theorists	Definition of Stress	Source (s) of Stress	Model Strengths	Model Weaknesses
Psychodynamic theory	Freud (1966)	Defined primarily by references to anxiety.	Signals of danger and intra-psychic conflict.	Uses few constructs with great power. Intuitive appeal.	Inadequate in scope or no consideration of biological or social factors. Difficult to test.
Learning theory	Watson (1920) Pavlov (1927) Skinner (1953)	Faulty conditioning causing conditional emotional responses.	Presence of any conditional stimuli and / or reinforcing stimuli.	Empirically derived. Clear operational definitions for basic terms and procedures. Attempted explanation of related coping actions.	Scope is limited. Largely ignores any biological factors. Limited use of social-context factors. Ignores or denies importance of cognitive process.
Transactional theory	Lazarus & Launier (1978); Lazarus & Folkman, (1984)	Relationship between demand and coping sources.	Real or perceived psychosocial pressures.	Compatible with both the biological and social models. Large and growing body of supporting evidence.	Criticized for its circularity. Some constructs not well defined. Does not explicitly suggest how the mind influences body processes.
Social stress theory	Slavin et al. (1991)	Pressures to conform or adapt to social systems / norms.	Social conflict and coercion. Social change and living conditions. Lack of access to resources.	Incorporates many plausible social factors related to stress.	Very broad and ill-defined. Difficult to give terms operational reference. Ignores biological variables. Ignores individual difference.

Model	Related Theorists	Definition of Stress	Source (s) of Stress	Model Strengths	Model Weaknesses
Control theory	Schwartz (1982) Seeman (1989)	Disturbance between reference (normal) value and comparator value in feedback loop.	Any data that produce disequilibrium in the system.	Has potential to include all the different systems that influence stress reactions.	Difficult to operationalize and test
Holistic health theory	Girdano & Everly (1979)	No specific definition provided.	Implies that stress results from failure to treat the person as a functional whole.	Scope is global. Tacit acceptance of interaction between biological, psychological , and social factors.	Not a formal theory. Lacking in formal operational definitions. Lacking in specific supporting research.

Stress has been studied from a variety of individual or combined perspectives over the past few decades. Analysis of the stress literature reveals the numerous and varying approaches used in the conceptualization and understanding of the stress concept. Arriving at an understanding of psychological stress is inherently subjective. At a practical level this has led to a body of literature that is neither clear nor coherent in terms of how stress is understood and studied, for example in terms of varying definitions and terminology (Contrada et al., 2011), varying outcome measures (see summary in Table 4 on page 27), and in terms of varying or simplistic statistical analyses or lack account of confounding variables (Sandstrom, 2009; Martin & Sanders, 2003; Tamim et al., 2009; Fritz & Sonnetag, 2006; Goetzel, Kahr, Aldana, & Kenny, 1996; Roberston, 2011; Anshel et al., 2010). This is a less than ideal situation for an area that has been developing since the early 1900's.

Segerstrom & O'Connor (2012) have attempted to impose clarity and understanding by categorizing stress according to location, and refer to 3 models:

1 Externally based approaches: whereby stress is described in terms of external events or conditions that affect the individual. Traditionally these were stated in terms of physical stress, under pioneering theorists such as Seyle (1956) and Cannon (1939), and the concept of the General Adaptation Syndrome (GAS). Within the GAS framework the individual is seen as undergoing a series of automatic reactions in response to external stimuli. Within three stages (alarm, resistance, exhaustion) the individual responds in an attempt restore balance. In the alarm stage there is an initial physiological arousal, or 'fight or flight' response. During this stage the body mobilizes itself for action, for example, in the face of a predator or oncoming car, increased heart rate and blood flow to muscles. The resistance stage is characterized by attempts to adapt to or resist the stressor, for example, fast movements to avoid the car, fleeing or fighting the predator. In situations where the stressor is prolonged or chronic and repeated attempts to adapt or resist the stressor fail, the individual becomes unable to show further coping or resistance and becomes exhausted (exhaustion stage). Here resources are seriously depleted and illness (diseases of adaptation) may result. In certain situations stress can be considered adaptive or positive (what Seyle called eustress), for example, motivating the student to study for upcoming exams or the athlete to perform in competition. In other situations stress can be considered maladaptive (what Seyle called distress) and can lead an inability to cope or resist the stressor and a depletion of resources.

Additional more contemporary externally based approaches include those that have turned to the study of life events due to an external circumstance, for example that of adverse life events including the impact of illness, caregiving, and role change. While these are events are framed within a psychological model Segerstrom (2012) states these sources of stress are "*...still conceptually located in the circumstances"* (p. 129).

2 This can be contrasted with appraisal approaches that view stress from within the person: Here stress occurs and is maintained through an individual's perception of the stressor and the environment characteristics. The individual's appraisal of the event in relation to his / her resources determines whether an event is experienced as stressful. Two individuals can experience the same external event or environment but have different levels of stress or strain. A particularly relevant example is the transactional model, which conceptualizes this stress in terms of transactions over time between employee and environment (Lazarus & Folkman, 1984; Lazarus, 1989).

3 Thirdly, the authors describe approaches whereby stress is also located within the individual, but defines stress as 'that which causes distress' (p4.).

It is likely that these approaches are not mutually exclusive. As this thesis goes on to discuss, multiple elements can and are considered when attempting to understand, measure, and manage stress. The experience of stress requires both external (whether real or perceived) and internal factors to exist and these factors are likely to interact on some level. Segerstrom (2012) goes on to refer to stressor consequences, perceived

stress consequences and distress consequences. Imposing such an understanding is useful in order to understand the impact of stressors. For example, an event such as university campus relocation may lead to stressor consequences (increased workload or pressure to get ready for the move; changes to role; strained relationships; a need for increased peer or manager support), to perceived stress consequences (feelings of lack of control; increased emotion focused coping), and distress consequences (psychological distress; depression). In this way perceived sources of stress can be viewed as the independent variable and distress consequences can be viewed as dependent variables.

Cox and Griffiths (2010) argue that a useful taxonomy for understanding the stress literature, particularly with regard to occupational stress, is to distinguish it in two ways. Firstly, they suggest a distinction according to early vs. later contemporary theories.

Secondly, they suggest distinguishing within these two categories the early theories according to stimulus and response based theory, and the later theories according to interactional and transactional based theory (Cox, 1978; Cox and Griffiths, 2010).

Stimulus and response based theories reflect a process whereby external events or stressors act on the individual resulting in stress in a linear fashion. These are often referred to as ‘engineering models’ and are heavily criticised for allowing limited space for individual and cognitive factors. As previously discussed Seyle’s (1956) General Adaptation Syndrome is a useful example here, viewing stress as a consistent, primarily adaptive, and physiological reaction to an event.

In contemporary theories the individual is considered far more dynamic, and a greater role for psychological processes is recognised. Individual cognitive factors are emphasized as important in the stress response with recognition for both the appraisal process and interaction with the environment. Of key importance is how the event is perceived and this perception is based on appraisal of the event and related resources.

Early theories	Stimulus based
	Response based
Contemporary Theories	Interactional (structural based)
	Transactional (structural and process based)

Figure 4 Taxonomy of theories of work related-stress (adapted from Cox & Griffiths 2010)

Important classifications, according to the nature of the stress experience, are also made (Bryant, Friedman, Spiegel, Ursano, & Strain, 2010). Whether a stressor is acute (lasts a short time, but may be severe in nature: for example, an earthquake) or chronic (lasts a long time, also known as 'strain') (Weber, 2011) will affect individual outcomes. Whether stressors occur in isolation, cumulatively, or one after another may have important effects on outcome (Boss, 1988).

While factors such as the duration and number of stressors are relevant, it is increasingly acknowledged that the stressor itself is not necessarily the most important determinant of outcome. What is stressful for one individual may not be

stressful for another. Rather, the stressor can be seen as interacting with the individual and the environment in multiple ways to affect outcome.

Taxonomies have been operationalized through the development and use of different measures. Table 4 highlights the array of measures that have been employed at a practical level within the University setting to measure stress outcome (note: details of the review process identifying these outcomes are discussed in more detail in the section 'university context and occupational stress' (p.36) and in Appendix 1). The choice of outcome measure would refer on some level to dominant underlying models. The table highlights the fact that within the occupational stress literature what are described as input and output approaches are prevalent (Bhui, Dinos, Stansfield, & White, 2012). Input models include approaches which review 'inputs' such as job characteristics, or sources of stress such as poor work relationships, demands, management support, low control, social support, or adverse life events. Conversely, stress is also viewed in terms of outputs (or stress outcomes).

As demonstrated in Table 4, common stress outcomes that have been assessed in the University setting include measures of psychological distress or distress, anxiety, depression, satisfaction, and burnout. One outcome measure was deemed particularly well suited to the current research, the General Health Questionnaire 12 (GHQ12, Goldberg & Williams, 1988). It is a commonly used screening instrument that assesses Psychological Distress or 'mental ill-health'. It has been used in occupational and population studies (Tedstone, Moran & Kartalova- O'Doherty, 2007; Pevalin, 2000) and its psychometric properties have been well demonstrated across settings and cultures (Winefield et al., 2002; Andrew, 1999; Bankset al., 1980; Jackson,

2007). It is arguably one of the most widely used outcome measures in occupational studies (Jackson, 2007). It has been incorporated into the Scottish Health Survey (1995; 2003) thereby providing population comparative data that other measures do not have.

Table 5. Measures used to assess stress outcomes in the University setting

Measure /outcome	Measure used in which study of University employees?
HSE Stress Indicator (HSE, 2004)	Kinman & Court (2010)
Spielberger Trait Anxiety Inventory (1970)	Golman, Domitor & Murray, 1979
Epstein-Fenz Manifest Anxiety Scale (1965)	Golman, Domitor & Murray, 1979
Work-family conflict (Kopelman et al. ,1983)	Calvo-Salguero et al., 2010
5-item Minnesota Satisfaction Questionnaire (Weiss et al., 1965)	Calvo-Salguero et al., 2010
24 items from the Occupational Stress Indicator (Cooper & Williams, 1996); 2 additional items added assessing student quality & student evaluation; 16 item Work Locus of Control (Spector, 1988); Job Satisfaction Scale from the OSI-2; 3-item Psychological Distress Scale (Siu & Cooper, 1998)	Leung, Siu, & Spector, 2000
Occupational Stress Indicator (Cooper & Williams, 1996)	Michailidis (2008)
Psychological distress (6 items adapted from Lennon, 1987) Sense of Coherence (Orientation to life scale, Antonovsky (1987); Coe et al., (1989)	Ryland & Greenfield, 1991
Maslach Burnout Inventory (Schaufeli, Leiter, Maslach, & Jackson, 1996) Oldenburg Burnout Inventory (Demerouti et al.,2001)	Watts & Robertson, 2011 (12 burnout studies identified in recent systematic review); Davidson et al., 2010; Fritz & Sonnetag, 2006; Ghorpade, Lackritz & Singh (2007); Jamal, (1999); Van Emmerik, (2002)
Psychological distress / General Health Questionnaire (Goldberg, 1978)	Fritz & Sonnetag, 2006
Web based questionnaire	Catano et al., 2010

Measure /outcome	Measure used in which study of University employees?
Multiple measures	Biron et al., 2008
Job-Related Affective Psychological distress Scale (Van Katwyk, Fox, Spector, & Kelloway, 1999). (Psychological strains were measured with 14 items from the JAWS; additional items assessed sadness, anger, anxiety.)	Liu, Nauta, & Spector, 2008
Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) Organisational Justice Work-family conflict measure (Gutek et al., 1991). Job satisfaction measure (Brayfield and Rothe, 1951)	Judge & Colquitt, 2004 Thogersen, 2003
University performance data and self-report.	Jacobs et al., 2007
General Health Questionnaire (GHQ12: Goldberg & Williams, 1988); Effort-reward imbalance (Siegrist, 1996); 18-item Physical Symptoms Inventory (Spector & Jex, 1998); Work-family conflict (Netemeyer et al., 1996); Job satisfaction (10 items adapted from Warr et al., 1979); Job involvement: a five-item measure of job involvement was used (based on Kanungo, 1982); Over-commitment: A six-item scale developed by Siegrist (1996). Additional items assessed: availability of support; work family policy awareness; turnover intentions; working hours; job content including perceptions of demand & control ; work-life balance; perceptions of recent changes.	Kinman & Jones 2004
Maslach Burnout Inventory GS (Schaufeli & Van Dierendonck, 2000) Decision latitude scale from Karasek's 1985 Job Content Instrument. Scales from Kamphuis, and Van Poppel' s (1994) School Health Questionnaire assessed Stressors; Relationships with students and time pressure. Stress resulting from research Tasks scale developed by authors.	Taris et al (2001)
Author developed questionnaire items ("*Which of the following best describes the amount of stress in your job?*") with four response categories: (1) always stressed, (2) sometimes stressed, (3) rarely stressed, and (4) never stressed.	Fako, 2010
Assessed employees 'at risk' (i.e. effectively managing stress via relaxation, physical activity, and/or social support) using items from Evers et al., 2006.	Prochaska et al., 2008

Measure /outcome	Measure used in which study of University employees?
Workload returning from vacation (Karasek's, 1979 job demands scale + 2 items)	Fritz & Sonnetag, 2006
Conservation of Resources (COR) Evaluation Scale (Hobfoll & Lilly, 1993)	Davidson et al., 2010
The Faculty Stress Index (Gmelch, Lovrich, & Wilke, 1983)	Davidson et al., 2010
Five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin's, 1985	Davidson et al., 2010 Thogersen, 2003
The global self-worth (six items) and perceptions of job competence (four items) subscales from the Adult Self-Perception Profile (ASPP) (Messer & Harter, 1986) The Job Affect Scale (JAS; Brief et al., 1988)	Thorgersen, 2003
Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988)	Fritz & Sonnetag, 2006; Davidson et al., 2010
Self-reported anxiety (Houtman & Bakker, 1991)	Houtman & Bakker, 1991

Table 5 also shows the common stressors (or inputs) assessed in the university sector include workload, decision latitude, control, support, effort-reward imbalance, work-family conflict, support, and control. In the UK, the past decade has seen the adoption of one particular approach to workplace stress measurement that incorporates many of the concepts identified in Table 4. With high levels of stress evident the HSE have been monitoring sources of stress across occupations on an annual basis (Webster & Buckley, 2008).The approach was developed with the aim of reducing workplace stress in the UK and based on the increasing body of evidence identifying six work-related stressors as negatively associated with employee psychological distress (Cousins et al., 2004). The stress measure selected for use in this study was the HSE Indicator tool (Cousins et al., 2004; Mackay, Cousins, Kelly, Lee, & McCaig, 2004).

It was chosen because:

- It was developed specifically to address workplace stress in the UK.
- It has robust psychometric properties (see materials and method section for details).
- Its use is recommended by national regulating bodies and it facilitates employers to meet UK legislative requirements (Cousins et al., 2004).
- Meetings between the researcher and QMU representatives (management, HR, and staff) led to an agreement that it was the most appropriate measure.

Using the HSE measure to assess workplace stress is increasingly advocated and has been recommended in recent NICE (2009) guidance to promote psychological distress and productive and healthy working conditions (under recommendation 2, p. 10). The HSE Indicator is increasingly used to assess occupational stress (Gyllentsten & Palmer, 2005; Kerr, McHugh, & McCrory, 2009; Guidi, Bagnara, & Fichera, 2012). Results from the HSE Indicator tool are useful in that they provide:

- A stand-alone description of sources of stress
- Comparisons with a representative national survey of employees
- Suggested interim and longer term targets (based on the scores of the top 20% of respondents in a nation-wide survey).

It measures sources of stress that have been associated with negative psychological distress and productivity, including Demands, Control, Change, Relationships, Role,

Change, Peer and Manager support[1] (Cousins et al., 2004). These stressors can be conceptualized as hazards, that is: *"...those features (either physical or psychosocial or in combination) of the workplace that have the potential to lead to harm or unwanted consequences"* (Mackay et al., 2004, p. 96). It can be expected then that when there are high levels of these stressors there is an increased risk for harm or negative mental or physical outcome.

To the author's knowledge only one study has assessed the relationship between the HSE measure and psychosocial outcomes. Gyllentsten & Palmer (2005) employed the indicator tool with participants (N = 103) from a UK financial organisation and a Scandinavian telecommunications organisation to establish if workplace coaching could reduce stress as indicated by the HSE tool. While the coaching program did not predict outcome they found a significant model emerged regarding depression. A lack of control and role ambiguity predicted depression and high demands and role ambiguity predicted stress (as indicated by the DASS-21 Depression Anxiety Stress measure). However, there are several limitations associated with the design of this study. Firstly, two organisations in two different countries were used in this study and it is possible that cultural differences could have influenced outcome. Secondly, organisation variables could also have affected outcome as the organisations were from different sectors and had unequal numbers (UK organisation = 36; Scandinavian = 67). Finally, some participants had already received coaching and some had not which had the potential to influence the analyses.

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[1] These constructs are capitalised to indicate stress as measured by the HSE Indicator tool

This study extends the limited research relating to the HSE management standards measure and implements such longitudinal analysis to investigate the direct relationships between the HSE measure and Psychological distress. It was predicted that higher levels of stress would be associated with higher levels of psychological distress (see hypotheses, page 66).

While the HSE indicator is increasingly advocated it does not account for individual factors such as personality and coping. Input-output models are easily understood and can account for direct relationships between stressors and outcome. Here a common approach is to view the stressor as the Independent variable and the outcome as the Dependent variable. However, it is likely that this viewpoint is too simplistic, not accounting for additional complex contributions (such as additional individual and environmental factors) and their interactions. As Ryland & Greenfield (1991) point out, stress can be viewed as relational, concerned not just with inputs and outputs but with individual factors such as coping. Evaluating the role of coping and personality in the stress process is increasingly recognized and recent reviews have called for increased study of these potential mechanisms or pathways (for example, Segerstrom & O'Connor, 2012). The author was unable to identify any studies that have assessed coping and personality in the context of stress and psychological distress in the University sector or examining how these factors change over time. Before discussing the personality and coping literature specific findings relating to the University sector are reviewed.

1.6 The University Context and Occupational Stress

Worldwide, one group that has consistently reported high levels of stress are University employees (Catano et al., 2010; Daniels & Guppy, 1992; Gillespie et al., 2001; Jacobs, Tytherleigh, Webb, & Cooper, 2007; Kinman, 1998; Tytherleigh et al., 2005; Winefield et al., 2002; Mark & Smith, 2011; University and Colleges Union, 2008). This group has been identified as particularly at risk showing higher levels of stress and lower psychological distress when compared with a) the general population and b) with other occupations (Biron, Brun et al., 2008; Kinman & Court, 2010; Kinman & Jones, 2004).

Decreases in funding, increases in student tuition fees, quality assessments and research assessment exercises have been suggested as contributing to an increasingly competitive and high pressure environment (Rostan, 2010; Dutton, Burgess, & Nesbit, 2010).

Rostan (2010) suggested that changes in the University sector and specifically process changes (such as Universities becoming more autonomous and corporate in nature; increased managerialism; less direct government involvement and higher accountability and assessment; growing societal and economic expectations) have reduced what has commonly been referred to as 'academic freedom'. Universities are increasingly accountable, being required to provide evidence of effectiveness (Dutton et al., 2010).

Countries around the world have identified a need for improved strategies to manage stress in Universities (Winefield et al., 2002; Tytherleigh et al., 2005; Biron, Brun &

Ivers, 2008; Brun, Biron & Ivers, 2008; Kinman & Jones, 2004; Kinman & Court, 2010; Fako, 2010).

A series of related large studies in the UK, beginning in the late 1990's, have identified the specific vulnerability of University employees to stress and poor stress related outcomes (Kinman, 1998; Kinman & Jones, 2004; Kinman & Court, 2010). One of these studies (Kinman & Jones, 2004) examined sources of stress, psychological distress and work-life balance in 5000 HEI employees and identified high levels of Psychological Distress (approximately 50% being identified as 'cases' by Goldberg's 1988 12-item General Health Questionnaire). Of those surveyed 69% agreed or strongly agreed with the statement 'I find my work stressful' and only approximately half of participants found their work manageable. The most recent study, of University and Colleges Union members (Kinman & Court, 2010), found that the majority of psychosocial hazards or stressors exceeded the benchmarks suggested by the HSE. The study had a sample of 9740 University participants (of the 61,000 members invited to participate) who completed the HSE indicator tool. Of the 7 stressors identified in the HSE measure (demands, control, support from colleagues and managers, relationships, role and change) only the stressor of job control met the suggested HSE benchmark. Change, role, demands and support were the biggest stressors. The study also identified mean working hours as high with 35% of full-time staff working over 50 hours per week and almost 10% working over 60 hours. The two items relating to demands of 'I have to work very intensively' and 'I have to neglect some tasks because I have too much to do' had notably poor scores (1.97 and 2.61 respectively). This research shows the large number of UK employees reporting

an intense workload coupled with high stress levels. However the response rate is lower than that of the broader literature which ranges from 22% to 27% [for example, Winefield et al. (2002); Catano et al. (2010); Kinman & Court's (2010); Kinman & Jones 2004].

One large scale study of 17 Australian Universities (N=8732) conducted by Winefield et al. (2002) found that approximately 50% of Australian University staff were at risk of psychological illness (vs. 19% in the general population) with low levels of satisfaction amongst academics. Job satisfaction measures are increasingly used within occupational settings. A systematic review (Farragher, Cass & Cooper, 2005) of 485 studies (N=267,995) found a strong link between job satisfaction measures and physical and mental psychological distress. That is less satisfaction is associated with more psychological distress. Job satisfaction has been shown to be related to demands, support, lower levels of emotional exhaustion, lower depersonalisation, and lower anxiety (Dollard, Winefield, Winefield, & De Jonge, 2000). Based on these findings this study predicted that low levels of job satisfaction would be correlated with higher levels of Psychological Distress (see hypotheses, page 66).

Catano et al. (2010) randomly selected 1440 staff from 56 Canadian universities and found that 13% of employees reported high Psychological Distress and 22% had physical health problems.

A Hong Kong study involving four Universities (N = 106) found recognition, perceived organisational practices, and financial inadequacy correlated negatively with job satisfaction and locus of control, home/work interface and perceived

organisational practices (including poor communication, lack of feedback, being undervalued, conflicting demands, role ambiguity, social climate, discrimination, favouritism) to be related to Psychological (Leung et al., 2000).

Taris et al. (2001) studied employees from the Law department of a Dutch University (N = 246) and found that high levels of strain were related to increased withdrawal from work and that higher levels of perceived control (measured by Karasek's 1985 decision latitude scale) were related to lower levels of strain. Employees with lower reported control detached themselves psychologically from work more so than employees with higher control. From a logical viewpoint detachment from work means the quantity and/or quality of work will be reduced and is likely to result in costs for organisations. This is increasingly referred to in the literature as 'presenteeism', that is being present but unable (or unwilling) to work to one's capability (Bhui et al., 2000). Several studies have identified a relationship between stress and psychological outcome and it can be argued that a good measure of stress should be associated with stress related outcomes. This has yet to be established for the HSE management standards measure. This study predicted that higher levels of stress (as indicated by the HSE indicator) would be associated with higher levels of Psychological Distress (see hypotheses, page 66).

Other studies further highlight the stress problem in Universities worldwide. Biron et al., (2008) studied 1086 Quebec University employees and found that twice as many (40%) University staff had high levels of Psychological Distress compared to the Quebec norm (20%).

Jacobs et al. (2007) studied University performance statistics as well as employee self-report of productivity in 13 higher education institutions. They found stressors had a negative linear relationship with performance and that this relationship was influenced by health, psychological distress, organizational commitment, and the measure of performance used. Fako (2010) found that 81 percent of participants (N = 360 Botswana University employees) reported considerable occupational stress. One cross-cultural study (Jamal, 1999) found job stress to be significantly associated with psychological distress in teachers in Canada (N = 420) and Pakistan (N = 335).

In summary, these findings highlight the high levels of stress and low levels of psychological distress in the university sector. Based on these findings this study predicted that the QMU employees would have significantly higher levels of psychological distress when compared with general and other occupational populations (see hypotheses, page 66).

While the findings of high stress levels and corresponding costs suggest action to monitor and manage stress in universities, the legal case likely requires such action. The legal context for action along with the available evidence for intervention is discussed in subsequent sections. Before this, the next section reviews individual characteristics, and in particular personality and coping, that are relevant to the measurement and understanding of stress.

1.7 Individual contributions: Stress, Personality and Coping

There have been calls in the literature to further research the role of personality and coping in relation to stress (Segerstrom & O'Connor, 2012; McCrae, 2006; Conor-Smith & Flachsbart, 2007; Carver & Connor-Smith, 2010). Understanding how individual characteristics such as coping are related to more or less distress can lead to targeted interventions to reduce stress and improve employee (and organisational) and well-being. For example, including personality and coping measures can identify particular traits that place employees at risk as well as highlighting traits or strategies that may be protective. Ultimately this is an important goal of this research, to provide an evidence base that can be used by the university (and the broader occupational community) to justify and inform any necessary intervention.

In the early 1930's, coping was conceptualized within a psychodynamic framework in terms of strategies (for example unconscious defence mechanisms) employed to deal with internal threat (Freud, 1933) and thereby reduce anxiety (Gleitman, Fridlund & Reisberg, 1999).

More recently, research and theory surrounding coping has focused on more conscious strategies or approaches to reacting to situations or events (Folkman & Lazarus, 1988; Billing & Moos, 1981). While defining coping has been problematic, several definitions have been put forward. Folkman & Lazarus (1980) explained coping as the cognitive and behavioural efforts to master, reduce or tolerate environmental and internal demands. Attempting to summarize the research, Matheny and colleagues defined coping as "*any effort, healthy or unhealthy, conscious or*

unconscious, to prevent, eliminate, or weaken stressors, or to tolerate their effects in the least hurtful manner" (Matheny, Aycock, Pugh, Curlett, & Silva-Cannella, 1986, p.509). The latter definition highlights the fact that coping may not always be positive or 'healthy' and has the potential to be maladaptive.

Coping is often discussed in terms of stress or response to stress and a transactional and dynamic model has been advocated by many (Lazarus & Folkman, 1984; Endler, 1988; Endler & Parker, 1999). Here individuals interact with stressors in an evolving process that involves appraisal and reappraisal of the stressful situation or event. The stress response involves "*the primary appraisal of the stressor and secondary appraisal of the persons internal resources*" (Ogden, 2004) whereby person and situation variables interact in a continuous feedback loop. This transactional model emphasizes the fact that an individual's subjective perceptions are important to the appraisal of the stressor and consequent responses.

The objectives or goals of coping are to reduce stressful conditions and enhance the likelihood of recovery; to adjust or tolerate negative events; to maintain positive self-image; and to maintain emotional equilibrium or balance (Cohen & Lazarus, 1979, as cited in Ogden, 2004, p. 269). Coping can be seen as a mediator or 'buffer' that functions to protect the individual and facilitate successful adjustment.

Individual variability is perhaps the defining concept within coping. Appraisal and perception are central in the individual's coping response. Firstly, different individuals perceive stressors in different ways. such that what is perceived as stressful or threatening for one individual may not be for another. In this way a

"*stressful situation may not be perceived as threatening for an individual who either does not recognize the inherent danger or has the necessary skills and experience to cope with it*" (Spielberger, 1976, p 5). These 'necessary skills' will depend on factors such as age, education level and life experiences (Endler & Parker, 1999).

Psychological factors such as personality also play an important role in determining how one appraises a situation and the effectiveness of coping techniques that result. For example, Schneider, Rench, Lyons, & Riffle (2011) found that individuals high in Neuroticism have higher threat appraisals, that is they perceive demands to outweigh coping resources, and that this in turn leads to poorer performance. They also found that individuals high in Openness had lower threat appraisals which led to increased positive affect. Individuals high in Conscientiousness, Extraversion, and Openness tend to interpret events as being challenging as opposed to stressful or threatening (Penley & Tomaka, 2002). Agreeableness is associated with less interpersonal conflict and therefore less relationship stress (Asendorpf, 1998). Carver and Connor –Smith (2010) review the evidence relating to personality and assert that context is important to the importance of any given dimension and outcome. For example, in situations where interpersonal stress is high, higher Agreeableness is likely to be particularly protective.

Personality characteristics influence levels of quality of life (Testa & Simonson, 1996; Grey, Boland, Yu, Sullivan-Boylai, & Tamborlane, 1998). That is, individuals with certain traits (such as Neuroticism) tend to report poorer quality of life. The individual's psychological disposition is also closely related to cognitive and emotional aspects of their coping styles (Bandura, 1995). Segerstrom & O'Connor

(2012) highlight evidence demonstrating that individuals low in Conscientiousness have less positive reactions to stressful encounters compared to individuals high in Conscientiousness. Ghorpade, ALckritz, & Singh (2007) found personality to be related to burnout in University employees. These authors found that employees higher in Extroversion and Openness had lower levels of emotional exhaustion. Schneider (2004) found that individuals high in Neuroticism report higher levels of stress, distress and poorer coping responses. Personality traits such as Neuroticism have been demonstrated to influence the stress response, which is in turn influenced by coping strategies (Kobasa, Maddi, & Pucetti, 1982). As Vollrath (2001) argued Neurotic individuals are more likely to appraise an event as stressful and also to choose an ineffective coping strategy such as emotion or Avoidance focused coping. A large body of evidence supports a relationship between the five-factor model of personality and multiple health and psychological distress outcomes including satisfaction and performance (Ozer & Benet-Martinez, 2006). This 'Big Five' model measures five personality constructs of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Goldberg, 1999) and has been shown to be robust across several cultures, age and gender groups (see materials section 2.4.4). While personality is generally considered a stable trait some recent evidence suggests that personality may change over time (Mroczek and Spiro, 2007; Roberts Caspi, & Moffit, 2003; Roberts, Walton, and Viechtbauer, 2006).

Consistently, Conscientiousness, Extraversion, Openness, and Agreeableness are identified as protective, being associated with decreased distress and physical health (Carver & Connor-Smith, 2010). Of the big five, Neuroticism is the personality

dimension consistently demonstrated to have the poorest outcomes. McCrae (2006) states the "*Relations among these variables may be due to the common influence of Neuroticism rather than processes of stress and coping*" (p. 237). In the measurement of stress the most important variable to control for is Neuroticism (McCrae, 2006). Neurotic individuals may be more reactive to stressors, more likely to appraise situations as threatening, and more likely to choose ineffective coping strategies (Schneider, Rench, Lyons, & Riffle, 2011; Bolger & Schilling, 1991). This study predicted that Neuroticism would be associated with stress and psychological distress (see hypotheses, page 66). Predictions that the remaining four personality dimensions would be associated with less stress and less distress were also made.

Coping skills are developed and learned in order to respond to difficult negative, stressful, upsetting events or situations and the anxiety that may be created by these situations (Endler & Parker, 1999). The fact that coping skills are modifiable, and can be developed and learned, is an important point and in a sense validates the considerable research attention they have been given. It is arguable that addressing ineffective coping approaches is more productive than attempting to change more stable and enduring traits such as personality.

Research has shown the effectiveness of educational programmes to facilitate and develop coping skills in order to reduce physical and mental distress (Whittemore et al., 2012; Coughlan, Shehan, Carr, Cockram, & Crowe, 2004b; Grey, Boland, Davidson, Yu, Sullivan-Boylai, et al., 1998; Grey, Boland, Davidson, Li, & Tamborlane, 2000; Garland, Gaylord, Park, 2009).

Increased awareness of the important contributions of psychological factors to health and illness has resulted in recognition of the role of coping in adjustment. Coping strategies have been shown to mediate between stressors (for example chronic illnesses such as diabetes) and consequences such as physical and psychological distress (Billings & Moos, 1981; Peyrot, McMurry, & Kruger, 1999).

Since the recognition of the importance of coping, researchers have attempted to classify different types of coping and subsequent measurement. These coping styles can be defined as characteristic or typical manners employed to confront and manage stressful situations (Folkman & Lazarus, 1980). Endler & Parker (1999) suggest this is comparable to a habit or typical manner of trying to resolve problematic situations. A preferred coping style is thus employed to deal with stressful situations. It is also recognized that an individual's preferred coping style may not be feasible in certain circumstances. Of course, certain situations (for example emergencies) call for specific coping styles and a least preferred strategy may be employed (Endler & Parker, ibid.).

The possible dimensions of coping have been the focus of much study (Endler & Parker, 1990a; Folkman & Lazarus, 1980). The literature consistently identifies several main coping styles on which there is a considerable agreement: those of Avoidance, Emotion-focused and Problem-focused coping (Endler & Parker, 1992; Folkman & Lazarus, 1980; Rice, 1999; Ogden, 2004). Problem or Task-focused strategies refer to "*active attempts at dealing with stress, either behaviourally or cognitively*" while Emotion focused coping refers to "*strategies such as ruminating, daydreaming, and emotional responses to stress*" (Endler & Parker, 1992, p.5). An

Avoidance coping strategy "*refers to activities and cognitive changes aimed at avoiding the stressful situation and can occur via distracting oneself with other situations or Tasks or via social diversions*" (Endler & Parker, 1999, p.33). Strategies do not have to operate independently and individuals can use both strategies at the same time (Rice, 1999).

The primary focus of Task coping is on actively trying to solve the problem by "*taking action to reduce the demands of the stressor or to increase the resources available to manage it*" (Ogden, 2004, p.270). Emotion-focused coping involves reactions that are self-oriented and include emotional responses, self-preoccupation and fantasizing and may serve to increase stress rather than decrease it (Endler & Parker, 1999).

Coping style has also been shown to be related to adjustment and outcome in a variety of illnesses (Billings & Moos, 1981; Endler & Parker, 1990b; Endler & Parker, 1992; Bombardier, D'Amico, & Jordan, 1990). Its association with depression and somatic symptomatology has been identified in several studies (Billings & Moos, 1981; Endler & Parker, 1990).

Problem or Task-focused coping has been demonstrated to be more effective than emotion-focused coping in relation to reducing negative emotional reactions and in improving performance and functioning levels (Zeider & Saklofske, 1996; Ben-Zur, 1999; Zeider & Ben-Zur, 1994; Zeider, 1995).

It has also been associated with better adjustment in patients with chronic illnesses including less psychological and physical distress (Endler & Parker, 1992; Pakenham & Rinaldis, 2001). Individuals who tend to use a Problem focused coping style may

be more effective at dealing with stress and its impact on everyday life. In effect, coping style may serve as a 'buffer' against stress. This study predicted that employees with higher levels of Problem focused coping would have lower Psychological Distress (see hypotheses, page 66].

Conversely, individuals whose preferred coping strategy is that of Emotion coping may benefit from training or education to adopt a more adaptive style of coping. The use of Emotion focused strategies have been shown to be negatively related with outcome, adjustment and to higher levels of distress (Ben-Zur, Gilbar, & Lev, 2001; Pakenham & Rinaldis, 2001; Goodkin et al., 1992). The present study predicted that employees with higher levels of Emotion focused coping would have higher levels of Psychological Distress (see hypotheses, page 66].

No predictions were made regarding Avoidance coping as the evidence seems to be equivocal. Some research suggests a link to positive outcomes (Brashers, Goldsmith & Hsieh, 2002; Constant, Castera, Quintard, Bernard, Ledinghen, et al., 2005), and some to negative outcome (Billings & Moos, 1989). One possible explanation is that avoidance coping may be an effective coping strategy in certain situations but not in others. For example, in stressful situations where the stressor or its management is not perceived as controllable avoidance coping techniques (such as engaging in distraction) may be protective (Compas, Malcarne, & Fondacaro, 1988).

Research demonstrates that certain traits and coping strategies are important to outcomes such as psychological distress and experience of stress. As noted earlier evaluating the role of coping and personality in the stress process is increasingly

recognized and recent reviews have called for increased study of these potential mechanisms or pathways (Segerstrom & O'Connor, 2012). Examining relationships between protective traits or strategies and stress outcomes can lead to an improved understanding as to how and why some people experience more stress than others. Importantly, this understanding can then be used to tailor interventions to populations or sub groups.

In addition to understanding potentially protective or risk disposing coping strategies, knowledge of employee health behaviour is also valuable to the employer. Certain health behaviours can be viewed as coping mechanisms and have been shown to be associated with physical health and psychosocial outcomes in university employees (Anshel et al., 2010; Goetzel et al., 1996; Robertson et al., 2011). Coping behaviour knowledge, such as understanding the proportion of employees engaging (or not) in counselling can be used to inform employee assistance programmes. Establishing why employees do not use counselling (choice; expense; lack of availability or awareness of service; confidentiality issues) may then inform a beneficial avenue of intervention.

Similarly, understanding complementary or alternative (CAM) therapy usage may be relevant as populations under stress may be more likely to use these treatments (Langhorsta et al., 2007; Connolly & Willock, 2009).

1.7.1 Confounding Demographic factors in the stress and psychological distress relationship

Several demographic factors have been identified as contributing to stress and psychological distress in University employees. De Jonge et al., (2010) assert that age,

gender, and education are acknowledged as the primary possible confounders in the work-related stress and psychological distress relationship. Specifically as regards the HSE stress tool and its relationship with psychological distress, studies have focused on these three variables (Kerr et al., 2009; DeJonge et al., 2010; Gyllensten & Palmer, 2005) and have used similar multiple regression analyses in doing so.

1.7.2 Gender

Gender has been identified as important in the experience of stress and psychological distress for University employees (Watts & Robertson 2011; Bond, Punnett, Pyle, Cazeca, & Cooperman, 2004; Elliot, 2008; Taris et al., 2001; Lackritz, 2004; Kinman & Jones, 2004;Ryland & Greenfield, 2009; Houtmann & Baker, 1991).

Taris et al (2001) studied Dutch University staff (N=131) and found that female staff reported higher levels of strain than male staff. Lackritz (2004) in their study of 265 University academic employees found that female employees had significantly higher emotional exhaustion scores than male employees, and that male employees had higher depersonalisation scores. More recently, Watts and Robertson (2011) conducted a systematic review of the literature on burnout in University teachers and identified the same findings of higher depersonalisation scores in male employees, while female employees tended to have higher scores on the emotional exhaustion dimension. Kinman & Jones (2004) found that of 824 UK academic staff 44% of male staff had seriously considered leaving the education sector compared to 56% of female staff.

As Calvo-Salguero (2010) points out, the potentially predicting role of gender may in part be supported by Role theory (Katz and Kahn, 1978), Role Identity Salience

Theory (Stryker, 1992) and Gender Role Theory (Gutek, Searle, & Klepa., 1991). Opre & Opre (2006) suggest that female academic staff are subjected to 'stereotype threat', which sees women subjected to additional pressures resulting from traditionally male dominated environments. An increased fear of being viewed according to a negative stereotype has been shown to decrease performance in multiple contexts. For employees, gender stereotype threat may be accentuated in gender dominated environments. Similarly, challenges facing female staff may be different than those, for example, differing rates of career progression (Branch-Briosa, 2009).

Bond et al. (2004) found that organisational factors associated with psychological distress differed between male and female dominated jobs. Houtman & Bakker (1991) found that reported anxiety differed for female student lecturers.

Elliott (2008) found that male and female University faculty experience similar levels of work and family role strain but that there are important differences in the sources of strain. For female employees family conditions were the dominant source of strain, whereas male employees identified work conditions as the primary source of strain.

It should be noted that while there are an increasing number of studies demonstrating an effect for the role of gender in stress outcomes, several studies have not found any gender effects (Dua, 1994; Jamal, 1999; Leung et al., 2000). Jamal (1999) found that gender did not moderate the stress-psychological distress relationship in employees in Canadian and Pakistan samples.

However, the balance of evidence points to higher levels of psychological distress in female employees compared to male employees. This study predicted that female employees would have higher levels of Distress than male employees (see hypotheses, page 66).

1.7.3 Age

Research has identified a potentially influencing role for age and experience in stress related outcomes. Houtman & Bakers (1991) found psychological (anxiety) and physiological (heart rate, cortisol) reactivity differed according to experience. Lackritz (2004) found an inverse relationship between age and burnout in academic University employees. Similarly, a recent systematic review by Watts and Robertson (2011) found that younger employees were more vulnerable to emotional exhaustion. In line with these findings this study predicted that age would be negatively correlated with Psychological distress (see hypotheses, page 66]. That is, as age increases Psychological Distress will decrease.

1.7.4 Marital status and social support

Marital status has also been identified as a potentially influencing factor for staff with a limited number of studies revealing poorer mental health and more stress among single women when compared to married women (Siu, Lu, & Cooper, 1999). Leung et al. (2000) found that married professors had less psychological distress than single professors. We therefore included marital status in our questionnaire so that we could investigate any potential relationships with stress of distress. In line with Leung et al.

(2000) it was predicted that married employees would be less distressed than unmarried employees (see hypotheses, page 66).

Social support has been associated with lower levels of psychological distress and decreased stress. One large study of 1064 Dutch University staff found that support from supervisor and colleagues reduced both dissatisfaction and emotional exhaustion (Taris et al., 2001). Bond et al. (2004) identified the strongest correlate of job satisfaction in University employees to be social support. Along with marital status, the HSE stress measure used in this study has two in built indicators of social support, that is peer support and manager support.

1.7.5 Job classification

Research has identified academic staff as particularly at risk, showing the highest levels of distress coupled with the lowest levels of job satisfaction (Winefield et al., 2002). Gillespie et al. (2001) found higher levels of stress in Australian University academic staff than general staff. Similarly, Kinman & Jones (2004) found that UK academics were more likely to report that their job was stressful when compared to non-academics (80% agreed or strongly agreed that their job was stressful compared with 64% of non-academic staff). In line with these findings this study predicted that academic employees would have higher levels of Psychological Distress than non-academic employees (see hypothesis, page 66).

Findings highlight the importance of individual factors to stress and psychological distress in the university setting. That relationships between demographic factors and stress have been found indicates that they should be measured in stress research. This

allows for a greater and more accurate understanding of their role in the stress and distress experience. This is particularly important as it might identify if particular subgroups (for example, academic employees; male or female groups) that would benefit from specific intervention. It also allows interventions to be highly targeted towards these groups. For example, a stress audit finding that a lack of control is a major stressor for younger but not for older employees can inform interventions to improve levels of control. Increasing supervisor support can increase perception of control and job satisfaction (Logan & Ganster, 2005). Increased perceptions of control are in turn associated with a problem-focused coping approach which has been associated with psychological distress.

Despite a coherent argument for incorporating personality and coping into stress research and intervention in universities this is rarely realised. The next section discusses approaches to stress management and reviews the literature relating to stress intervention in universities. The aim of the review is to present the available evidence and facilitate recommendations for QMU and the university sector.

1.8 Managing stress: Varying approaches, the legal context, and risk assessment

1.8.1 Varying approaches to stress intervention and management

Traditionally, stress management strategies have been conceptualized (and managed) at the level of the individual with limited consideration for other relevant organisational factors. Individual level approaches focus on how the individual responds or manages stress, whereas organisational level approaches focus on the underlying causes. More recently reactive approaches that focus solely on the individual have drawn criticism for their inability to address the underlying stressor and for placing responsibility for stress management solely with the employee. More recent approaches recognise that the employer is responsible for ensuring workplace stressors are minimised and managed (see section 1.8.2, p.56/7), that it is not solely the responsibility of the employee to 'fix' or manage stress.

The primary classifications that can be found in the literature reflect this. Matteson & Ivancevich (1987) distinguish preventative and curative strategies. DeFrank & Cooper (1987) distinguish stress interventions according to individual, individual-organisation interface, and organisation, while Murphy's (1988) classification includes three levels of intervention – primary, secondary, and tertiary. Primary prevention strategies aim to address or prevent the cause of stress. Secondary interventions are mainly aimed at individual coping responses to stress. Tertiary interventions are reactive or rehabilitative in nature (for example, helping employees recover from stress related illness). The theory would agree that primary prevention strategies are to be considered the gold standard as outlined by La Montagne (2007, Figure 5). However,

the literature is inconclusive as to the degree to which approaches are used in practice within organisations (La Montagne et al., 2007; Dollard & McTernan, 2011; Ruotsalainen et al., 2008; Caulfield et al., 2004; Gigi et al., 2003).

Intervention Level		Intervention Targets	Examples	Systems Integration
Definition & Description	Effectiveness			
1° — Primary • Preventive, proactive • Goal: reducing potential risk factors or altering the nature of the stressor before workers experience stress-related symptoms or disease	+++	• Stressors at their source; organisation of work; working conditions	• Job redesign, workload reduction, improved communication, conflict management skills development	
2° — Secondary • Ameliorative • Goal: To help equip workers with knowledge, skills, and resources to cope with stressful conditions	++	• Employee responses to stressors (perceived stress or strain)	• Cognitive behavioral therapy, coping classes, anger management	
3° — Tertiary • Reactive • Goal: To treat, compensate, and rehabilitate workers with enduring stress-related symptoms or disease	+	• Short-term and enduring adverse health effects of job	• WC system, Return-to-work programs, occupational therapy, medical intervention stress	

Figure 5. Systems approach to occupational stress (from La Montagne (2007, p. 269)

Gigi et al. (2003) reviewed the UK-based research and found the majority of the 16 identified studies involved interventions targeted at the individual employee. In their review of the general job stress literature La Montagne et al. (2007) identified 90 studies, 52% of which were either primary or secondary prevention (or a combination of the two), and 48% of identified studies included little or no primary preventive interventions.

Numerous examples of interventions aimed at addressing occupational stress are reported in the literature (La Montagne et al., 2007; Jordan et al., 2003; Ruotsalainen et al., 2008). However a brief examination demonstrates the difficulties in establishing efficacy of interventions aiming to address occupational stress, including variation in design, measurement and evaluation (for example, see La Montagne et al., 2007; Dollard & McTernan, 2011; Ruotsalainen et al., 2008).

Additionally, it cannot be presumed (often due to the 'context' or 'occupation specific' nature of many interventions) that measurement and intervention strategies applied in one occupational setting can be transferred to the University sector. This is relevant for the University workplace, which can be seen as distinct from other occupational settings, specifically regarding levels of stress and psychological distress. To date there is limited evidence as to appropriate interventions to manage stress or improve psychological distress in this setting. The author reviewed the literature to identify effective interventions within the University sector and facilitate appropriate recommendations (see Appendix 1 for more detailed information on the review protocol).

A total of 10 studies (from 1710 abstracts screened) were identified and are summarised in Appendix 24. Most studies evaluated interventions involving individual level approaches with single interventions [including, Yoga (Hartfiel et al., 2011); massage (Sandstrom, 2009); holidays (Fritz & Sonnentag, 2006); sabbatical (Davidson, 2010); Tai Chi (Tamim et al., 2009)], or individual level approaches with multiple interventions [including, a parenting program (Martin & Sanders, 2003); a risk assessment, stress training and exercise program (Robertson, 2011); a wellness program

(Goetzel et al., 1996); a wellness and DVM[2] program (Anshel, Brinthaupt & Minsoo Kanga, 2010)], or individual-organisational level approaches [including an organisational development intervention (Gavin & MacPhail, 1978), and an action research stress management intervention (Brun, Biron & Ivers, 2008)]. Appendix 24 provides detailed information and appraisal of these interventions. All studies (3 RCT's, 1 matched control study, and 6 pre-post-test studies) found significant improvements on psychosocial outcomes.

Many of the studies included an exercise component. Studies from the Health Psychology arena have led to an increasing interest in exercise interventions in occupational settings due to the possible physical and psychological benefits for workers, and the potential to offset levels of stress and illness. Because exercise reduces cardiovascular risk, and because psychosocial stress at work is associated with increased cardiovascular disease (Bache et al., 2010), exercise interventions in the workplace are likely to become more prevalent. Strong evidence exists showing that benefits of exercise, including a link to longevity (Paffenbarger, 1986), to decreased cardiovascular disease (Blair et al., 1989), improvements in depression (Hall et al., 2002), self-esteem and confidence (Sonstroem & Morgan, 1989).

Three studies found some deterioration on outcome and all studies received low appraisal scores (≤6/10). It is clear that there are a small number of evaluated interventions, many with limitations in methodological quality. Most study designs fail to account for recognised important confounding variables (e.g. age, gender, job

[2] Disconnected Values Model (Anshel, 2008; Anshel & Kang, 2007)

title and status, education, ethnicity, group interaction, drop-out, previous treatment effects) and/or did not attempt to control or adjust for confounders (Appendix 25, p. 267).

Some evidence exists that interventions can improve psychosocial outcomes in University employees and the dominant strategy is currently secondary intervention. Making conclusions regarding efficacy is difficult but the results highlight important considerations for future research and intervention, and present a summary of the available evidence. Importantly they highlight the need for more rigorous approaches to designing and evaluating stress interventions in the future.

As mentioned at the beginning of this section, what we can be certain of is that there is a stress related problem in the University sector and a corresponding moral, and business case for addressing it. Stress audit and assessment are recognised nationally and internationally as the first step to manage or prevent stress in the workplace and can be used to identify subsequent interventions to tackle stress. This process is discussed after the next section. Before this the next section highlights the legal case for managing workplace stress.

1.8.2 The Legal context and employer responsibility

Workplace stress has received increased attention in recent years both from a legislative and organizational perspective and an increase in health and safety guidelines and legislation have necessitated a greater awareness and proactive approach to stress management. Within the United Kingdom the employer has a duty to ensure the health, safety and welfare of all employees in criminal law, under the

Health and Safety at Work Act (1974), and this can be interpreted as including mental and psychological distress. Similarly, the Management of Health and Safety at Work Regulations Act (1999) imposes specific responsibilities including the duty to ensure workers are not made ill by their work, and for the employer to take reasonable steps to deal with risks; these include conduct of risk assessments and the subsequent implementation of measures identified as necessary to ensure health and safety of the employees.

The Safety Representatives and Safety Committees Regulations (1977) and The Health and Safety (Consultation with Employees) Regulations (1996) require employers to consult with employees on health and safety issues. The HSE and local authorities enforce the criminal law and serve improvement notices, fines, prohibition notices and where necessary criminal prosecutions in the courts. A variety of additional guidelines and information documents are available from the HSE website (http://www.hse.gov.uk/).

Additional legislation is also relevant for employers (Employers' Liability Act 1969; The Public Order Act 1986; The Disability Discrimination Act 1995; The Employment Rights Act 1996; The Protection from Harassment Act 1997; The Working Time Regulations Act 1998) and case law examples of employer liability for psychiatric damage (Earnshaw and Cooper, 2001; Edwards, 2006) highlight the obligations of the employer.

Taking reasonable steps to identify risks, such as conducting audits or risk assessments, enables employers to meet their duty of care. The HSE Management

Standards (Mackay et al., 2004; Cousins et al., 2004), although non-legislative, assist employers to meet their duty of care and to assess occupational stress risks. Cousins et al. (2004, p. 131) state that "We are now at the point where we can assert that adopting the methodology of the Management Standards will normally mean that an organization is doing enough to comply with Health & Safety law."

1.8.3 Stress audit and risk assessment

With studies suggesting that psychological stress is a regular and increasingly prevalent feature of workplace life for university staff (Fisher, 1994; Kinman, 1998; Cox, Griffiths & Gonzales, 2000), the importance of monitoring, evaluating and developing effective interventions is to be considered a priority. While there is limited evidence as to effectiveness of stress management interventions in University settings, it is reasonable to argue that the first step in effective intervention is identification of the problem. Reference to models of risk assessment identifies the important role of on-going monitoring, intervention and evaluation in the risk management process (for example, Jordan et al., 2003; Biron et al., 2006; Brun, Biron & Ivers 2008; Biron, Brun & Ivers 2008; Clarke & Cooper, 2000; 2004).

In the UK, the HSE has suggested that organisations adopt a preventative, risk assessment based approach (Cousins et al., 2004). In order to address the high level of work related stress it developed a series of management standards and validated a measure [The HSE Indicator Tool (Mackay et al., 2004; Cousins et al., 2004)]. For all organisations, assessment and evaluation should play a central role in achieving the best practice goals of stress management, that is, "*to prevent stress happening or,*

where employees are already experiencing stress, to prevent it from causing serious damage to their health or to the healthiness of their organisation" (Leka, Griffiths & Cox, 2003, p. 2). Figure 6 highlights the risk management process and shows how the assessment of risk facilitates the creation and evaluation of subsequent action plans.

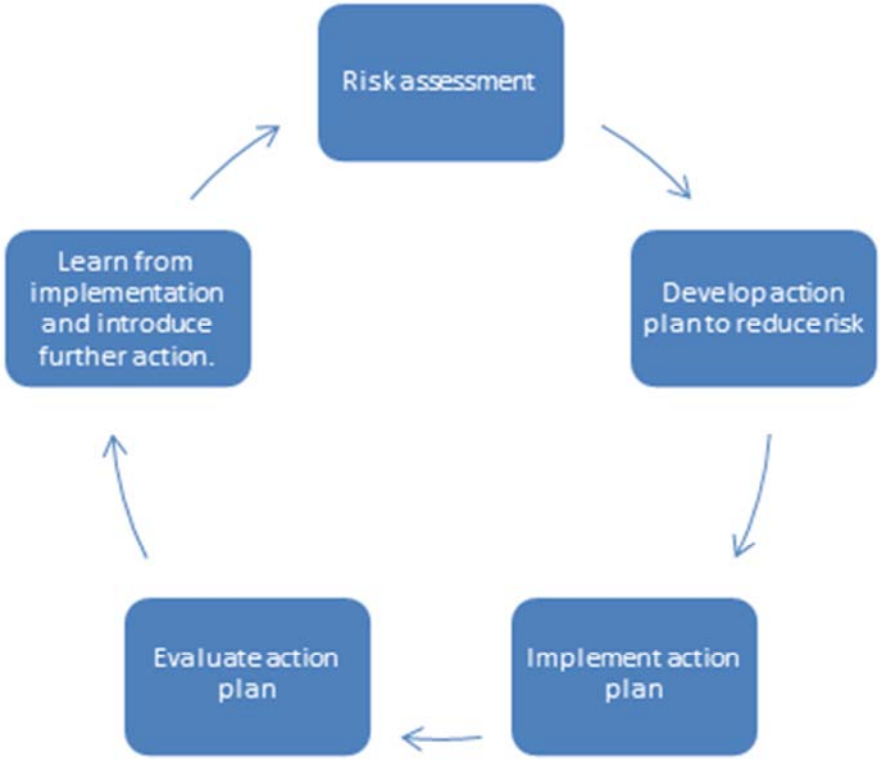


Figure 6. The Risk Management Cycle (adapted from WHO, 2003)

Initial assessment of the problem is a vital first step that permits effective management. In order to manage stress effectively the organisation must first correctly diagnose the workplace characteristics that pose risks for employees, and identify at risk job categories (The HSE, 1995; 2000; Leka et al., 2003). As Biron et al. (2006) point out "*by determining which work characteristics employees are the most exposed to, and which are most associated with health, managers and employers*

can make more informed decisions in order to reduce stressful work conditions and their consequences" (p. 418). This information can then be used to inform stress management or related organisational change, for benchmarking purposes and evaluations of change.

As discussed earlier, the current study conducts this initial assessment in line with recommendations from the HSE and NICE. The next sections outline the theoretical approach, background, aims and hypotheses of the current study.

1.9 Theoretical approach to the thesis

This research takes the theoretical view that the experience of stress requires both external (whether real or perceived) and internal factors to exist and that these factors are likely to interact on some level. Individual factors (such as personality and coping will have direct and indirect effects on distress. This transactional model conceptualizes stress in terms of transactions over time between employee and environment (Lazarus & Folkman, 1984; Lazarus, 1989). The individual's appraisal of the event in relation to his / her resources determines whether an event is experienced as stressful. In this way two individuals can experience the same external event or environment but have different levels of stress or strain.

1.10 Background to the current study

In Scotland, high levels of stress have also been identified with 27,000 cases of work-related stress in 2011/12. This has remained stable since data collection began in 2001

(HSE, 2013d). Data from Scottish universities also suggest high stress levels (Robertson, 2010; University and Colleges Union, 2008; Abouserie, 1996).

NHS Scotland fund and implement the Scottish Centre for Healthy Working Lives (HSE, 2013) which provide a variety of supports to Scottish workplaces. The UK HSE stress management standards approach has been adopted in the Scottish context (e.g. Cousins et al., 2004; Health Education Board for Scotland, 2002). This includes support of the UK wide risk management approach and incorporation of the HSE Stress Indicator tool (Healthy Working Lives, 2005; 2013).

However, it should be noted that while similar management strategies (and in some cases similar legislative policy) are used in England and the UK the outcomes of this study are reflective of the Scottish context. Generalisation to universities elsewhere may not be appropriate. Studies conducted in different countries may be impacted by multiple context specific factors, including cultural and systemic influence. For example, even within the UK, different regulatory and support systems are relevant. In Scotland, the regulators have different powers of enforcement and there are different public support and health systems in place for employees. Consequently, support, funding and priorities in relation to employee stress and well-being may be different.

In May 2007 the researcher met with several key representatives (including staff and management) from QMU with a view to developing the on-going evaluation and monitoring of stress and psychological distress at the University. This collaborative approach aimed to *"promote a culture of participation, equality and fairness that is*

based on open communication and inclusion." and to *"ensure that the approach takes account of the nature of the work, the workforce and the characteristics of the organisation" (NICE, 2009, p. 8).*

In the months leading up to this meeting a literature review was conducted by the researcher, a study proposal developed and its implementation agreed upon. The study aimed to create a framework for on-going stress research and to facilitate the setting up of a related database in order to proactively monitor and manage any potential stress at the University.

1.10.1 Campus relocation

The research grew and developed from recognition that the process of change, such as campus relocation, may have powerful 'effects on employee's psychological distress' (Kinman, 1998). It was also recognised that assessing stress afforded the university the opportunity to meet Health & Safety Executive (HSE) guidelines and legislation and identify any groups that were at risk.

In 2008 Queen Margaret University relocated approximately 16 miles across the city of Edinburgh to a new open- plan campus in Musselburgh (Figure 7).

Figure 7. Map of campus relocation

Change has long been recognized as a potential source of occupational stress (Callan & Terry, 1994). Significant change within any workplace is likely to exacerbate existing sources of stress and potentially create new ones. Changes in terms of the process (for example communication, workload, planning, loss of staff), the physical environment (moving to an open-plan environment, transport and parking adjustments) and the potential impact on family can bring with them significant sources of stress.

While there is limited research in university or other sectors several studies have suggested the psychological component of relocation. One case study by Finch (2011) looked at the University of Salford's 'MediaCity' building relocation. He conducted and analysed interviews that suggested similarities with trauma and loss. Finch found that there was a feeling of loss that stemmed from attachment in a similar manner to

that of Kubler-Ross (1972) stages. He also identified themes such as a climate of uncertainty; ambivalence towards new technology; and a less personalized setting. Kagan & Shemesh (2005) found a relationship between uncertainty and anxiety amongst psychiatric patients during relocation into a new building. In a study of a leading supermarket chain, Moyle and Parkes (1999) found that relocation and demands independently predicted distress.

Several studies have found that transition distress can be offset by protective situational or personal characteristics such as levels of control, support, or beliefs. Gerpott (1990) found that employees being transferred internally had less psychological symptoms if they reported high support levels. Certain studies have shown negative organisational change outcomes were dependent on job level, with lower grades reporting poorer outcomes (Ferguson & Cheyne, 1995). Employees with previous relocation experience have also been shown to have better outcomes (Martin 1995).

Interestingly one relocation study of a large Australian transport authority (Peach, Jimieson, & White, 2005) tested the theory of planned behaviour (Ajzen, 1991) in employee support for relocation. Intention to engage in positive behaviours to support the move was significantly predicted by the perceived benefits (rather than disadvantages) of the move. Additionally, colleague and supervisor support for the move was an important contributor to intention. These findings suggest that social influence and perceived benefits of the move are important.

To the author's knowledge the research presented here is the first longitudinal study of its kind in the University sector. It can be seen as both a stress and distress 'audit' and a distinct piece of research and represents a necessary step in facilitating the on-going assessment and monitoring of stress at the University.

1.11 Aims

This study set out to identify individual and organisational factors that contribute to stress and distress. The primary research aims were as follows:

1 To identify and describe sources of stress, psychological distress, and job satisfaction.

2 To compare findings with occupational and population norms and recommend targets for improvement.

3 To investigate relationships between organisational (stress) and individual (distress, personality, coping, demographic) factors.

1.12 Hypotheses

As discussed in the introduction, this study made several predictions, the testing of which will provide knowledge that is either missing or equivocal in the literature. Within the university context there are few studies that have accounted for organisational, individual and demographic variables identified as important in the literature. Making and testing predictions in relation to these variables continues to be important to an understanding of occupational stress and psychological distress, and to identifying the intra and extra individual factors that predispose risk.

A primary interest of this study is to provide further information about stress in university employees using the HSE management standards measure. Currently in the UK the HSE Indicator tool is promoted in the management standards approach. A good stress measure is likely to be associated with stress consequences but there has been limited research examining this in relation to the HSE indicator tool. This study makes predictions to test whether stressors identified by the HSE indicator tool are associated with Psychological Distress.

Predictions are also made to bridge the knowledge gap relating to individual personality and coping factors within a stress and distress context. Specifically, the study seeks to test whether, and to what extent, relationships exist between organisational (stressors), individual (personality and coping), and outcome variables (Distress).

Section 1.6 (p. 33) of the introduction outlined the considerable evidence showing university employees to be a high risk group. While multiple studies show high levels

of stress and psychological distress, few studies have measured these variables over time or in the Scottish context. Similarly, little research has focused solely on university populations. This study tested the predictions that Scottish university employees would demonstrate high stress and distress levels, doing so at two time points.

This study also predicts that distress would be higher following relocation. The prediction is based on the fact that considerable changes are introduced by the relocation process and that change is an established stressor.

Section 1.7.1 (p. 46) showed several subgroups that may be more susceptible to stress or distress. These findings cannot be considered confirmed, with a limited number of studies, or with contradictory evidence available from other studies. This study makes predictions in the direction of the available evidence. Namely, these suggest that being male; older; married; and being in a non-academic job position will be protective in terms of stress and distress.

The following hypotheses, in line with the broader research and theory identified in the literature, were proposed:

H_1 Participants will have a significantly higher Psychological distress when compared with the general population and other occupational groups.

H_2 Psychological Distress would be significantly higher following relocation.

H_3 Low levels of job satisfaction would be correlated with higher levels of Psychological Distress.

H_4 Higher levels of stress would be associated with higher levels of Psychological Distress.

H_5 Personality would be associated with Psychological Distress in that: higher levels of Neuroticism would be associated with higher levels of Psychological Distress ($_a$). Higher levels of Extraversion ($_b$), Openness ($_c$), Conscientiousness ($_d$), Agreeableness ($_e$), would be associated with higher levels of Psychological distress.

H_{6-7} Regarding coping: Higher Emotion focused coping would be significantly related to higher levels of Psychological Distress **($_6$)**. Higher Problem focused coping would be associated with lower Psychological Distress **($_7$).**

H_8 Personality dimensions would be associated with sources of stress in that: Higher Neuroticism would be associated with higher levels of stress **($_a$)**. Higher levels of Openness **($_b$)**, Conscientiousness **($_c$)**, and Extraversion **($_d$)**, and Agreeableness **($_e$)** would be associated with lower levels of stress.

H_{9-11} Subgroup predictions: Academic employees would have higher levels of Psychological Distress than non-academic employees ($_9$). Female employees would have higher levels of Distress than male employees ($_{10}$). Married employees would be less distressed than unmarried employees ($_{11}$). That age

would be negatively correlated with Psychological distress. That is, as age increases Psychological Distress will decrease ($_{12}$).

2 METHODOLOGY

2.1 Design

The quantitative study employed a mixed design methodology (i.e. it is both a between-subjects and a within-subjects design). A pre-post design accessed participants before and after relocation. Results for all respondents at both time points are presented and the assessment of change was facilitated by matching participants. Details on the matching process are provided in the data management section that follows.

The primary independent variables (IV's) were conceptualised as the stressors or sources of stress. The dependent variables (DV's) were conceptualised as psychological distress and job satisfaction. The role of demographic, lifestyle, coping and personality variables were also assessed. Self-report measures were employed and are discussed further in the materials and measures section.

The study was divided into the following phases:

Time 1 – Before Relocation Baseline Assessment

Time 2 – After Relocation Comparison Assessment

The only inclusion criterion was that participants must be employees at the university. Interim findings have previously been presented and are available (Connolly, Willock, Hipwell & Chisholm, 2008, 2009). These reports were disseminated during the meetings with University representatives in order to facilitate timely consideration by the University. Initial stress indicators from Time 1 are useful in their own right, they

are reflective of the University at a time of considerable change (i.e. immediately before campus relocation) and become inherently more meaningful when compared alongside findings from Time 2. This thesis enables this longitudinal comparison, providing follow up data on staff Psychological Distress and key sources of stress.

2.2 Procedure

Ethical approval for the project was granted by Queen Margaret University Ethics Committee prior to commencement of the study. The methods adopted for the research were identified and developed following a review of the relevant literature and following consultation with university management and employee representatives. The researcher met with representatives from several areas including four members of academic staff (psychologists), Human Resources, administration, and Doctoral researchers interested in the area.

Data were collected through the self-administration of the study questionnaires and all 500 Queen Margaret University employees were invited to participate through internal mail. An electronic moderator mail was sent via Human Resources (HR) to every staff member approximately 24 hours in advance of questionnaire distribution. This provided details of the study, confidentiality procedures, and encouraged participation. This demonstrated to staff that the research and the time it took to participate was sanctioned by the University, important considerations in a busy pre-relocation period. A hard copy of the questionnaire (Appendices 2-8) and return addressed envelope were then distributed to every staff member through internal mail.

An introductory letter introduced the research and researcher, explained the procedure and aims of the study, and provided contact details of an independent advisor.

A reminder message was sent electronically through the college email system (moderator mail) approximately 2 weeks following initial distribution. Extra questionnaires were available on request. Questionnaires were returned to the researcher care of a University representative and subsequently collected and analysed by the researcher.

Table 6 describes the timeline of the research. The researcher also held meetings with QMU contacts throughout the course of the research, for example meetings with HR (such as arranging budgets for printing; advance and follow up email notification to employees; planning the distribution; providing updates and interim findings), administration (such as planning the distribution), and with supervisors.

Table 6. Timeline summary of research

Time frame	Action
January-Feb. 2007	Initial discussions concerning stress & Psychological Distress audit/research.
February-June 2007	Series of scoping meetings with QMU representatives; literature review; research proposal finalised & submitted.
May 2007	Ethics application submitted.
July 2007	Time 1 distribution.
October 2007	Preliminary findings & feedback to QMU representatives' contacts. Agreement to defer widespread dissemination until after Time 2 data collected to protect integrity of research. Delays with new campus construction lead to pushing back timeline of Time 2 distribution.
April 2008	Time 2 distribution.
July-September 2008	Time 1 Draft report consultation period & final report delivery
October 2008	Presentation of Time 1 report to QMU representatives; campus wide distribution.
December-Jan. 2009	Time 1 Report available online.

Time frame	Action
April 2009	Time 2 Draft report consultation period.
May 2009	Campus-wide dissemination; Time 2 report publicly available online; delivered to HSE work-related stress team as exemplar research example.
October 2009	Findings presented orally at the 23rd Annual Conference of the European Health Psychology Society and abstract published in the EHPS review.

2.3 Data management and anonymity

All data were anonymised and access was restricted to the author. In order to match participants each employee questionnaire was tagged with a numerical code. The sole purpose of these codes was to allow for the collection of 6-month follow up data. The keys to these codes were kept in a secure and separate location. No identifying information was sought in the study questionnaire and this was communicated to participants (via questionnaire information sheet and introductory email).

NICE provide the recommendation that "It is important to protect employee confidentiality and address any concerns employees might have about these processes of assessment and monitoring" (2009, p. 10). Anonymity was a primary consideration throughout the research. For example, an important component of the research was to identify group differences in Psychological distress and sources of stress. This is important in identifying groups at risk and informing practical interventions. However, it was recognized that breakdown by job classification would effectively identify small groups of individuals in several cases. It was therefore decided that data on certain occupational groups would not be presented to protect anonymity.

2.4 Materials & Measures

Questionnaires were used to measure coping, personality, job satisfaction, stress, and Psychological Distress (Table 7 below) and are provided in the Appendices. These were selected based on the following criteria:

- Psychometric robustness (validity, reliability etc.).
- Meetings between the researcher and QMU representatives (management, HR, and staff) led to an agreement that these were the most appropriate measures.
- The primary stress measure was directly in line with the HSE's management standards on work related stress. It was developed specifically to address workplace stress in the UK. Its use is recommended by national regulating bodies and it facilitates employers to meet UK legislative requirements (Cousins et al., 2004).

Table 7. Constructs and corresponding measures

Construct	Measure
Stress	HSE Indicator Tool for Work Related Stress
Coping	Coping Inventory for Stressful Situations (CISS) (adapted)
Personality	International Personality Item pool 'Big 5' measure
Psychological distress	General Health Questionnaire 12
Job satisfaction	Global Job Satisfaction (single item)

This research employs a quantitative methodology. This empirical approach emphasises objectivity and is inherently positivist in its epistemology (Bahari, 2010).

Quantitative measurement was chosen as the first step in a risk assessment cycle as is advocated by the current HSE management standards approach (Cousins et al., 2004; Mackay et al., 2004). It was felt that this approach was advantageous in that it provided data to facilitate future monitoring or benchmarking of stress and Psychological distress at QMU. The underlying approach is deductive, that is, it is informed by theory and seeks to test several hypotheses in relation to this theory.

It was recognised that face-to-face data collection methods such as interview may be of value in providing meaning and in-depth understanding (Bryman, 1984; Abushaba & Woelfel, 2003) in relation to stress, coping and Psychological Distress. However, within this setting a self-report method was deemed more appropriate for several reasons. Firstly, initial meetings with QMU representatives revealed that a separate study examining qualitative aspects of stress at the University was to be conducted. Secondly, with potential issues relating to perceptions of confidentiality, it was felt that the anonymous questionnaire method would improve participation rates and the likelihood of disclosure. Face-to-face approaches to data collection have been shown to lead to under-reporting of issues, particularly in regard to emotional and mental health issues (Lyons et al., 1999). Face to face methods (particularly within organisational and clinical settings) may affect honest disclosure. For example, social desirability can increase positive self-ratings of circumstances (Veenhoven, 2002). It was felt that the self-report postal method used in this study was likely to produce a more representative sample of the whole population and would allow for more useful statistical analysis.

This approach was deemed most appropriate only at this point in time and the researcher's position is that findings from this study can be used to complement and inform qualitative approaches in the future. These can in turn feedback to the design of future quantitative or mixed method approaches (Abushaba & Woelfel, 2003). These findings for example, can be used to focus subsequent face to face methods such as focus groups or interviews as has been suggested in the literature (Cousins et al., 2004; Abushaba & Woelfel, 2003).

2.4.1 Psychological distress

Psychological Distress was measured using the GHQ-12 (Goldberg & Williams, 1988). The GHQ is a widely used screening instrument that assesses Psychological Distress or 'mental ill-health'. Studies have shown high levels of sensitivity and specificity (Krespi-Boothby et al., 2010), and internal consistency [Cronbach coefficients range between .78 and .95 (Jackson, 2007)]. Its use has been widespread in occupational and population studies (Tedstone, Moran & Kartalova- O'Doherty, 2007; Pevalin, 2000) and its psychometric properties have been well demonstrated across settings and cultures (Winefield, Gillespie, Stough et al., 2002; Andrew, 1999; Banks, Clegg, Jackson et al., 1980; Jackson, 2007; Tedstone, Moran & Kartalova-O'Doherty, 2007).

It asks respondents questions relating to recent sleeping patterns, concentration abilities, self-esteem, stress, despair, depression, and confidence. A sample item is 'Have you recently been feeling unhappy and depressed?'

The GHQ12 can be scored using two distinct methods: 'average' scoring (also known as Likert) or 'caseness' (also known as bimodal) scoring methods. Reporting both average scores and caseness has been recommended in the literature (Sterud, Ekeberg & Hem, 2006) and provides greater depth of information as well as enabling comparisons between studies. The caseness method can be used as a 'case detector' or to flag individuals with probable psychiatric problems. The Likert or average scoring method is argued to be more appropriate for comparative purposes. Both scoring methods are reported here.

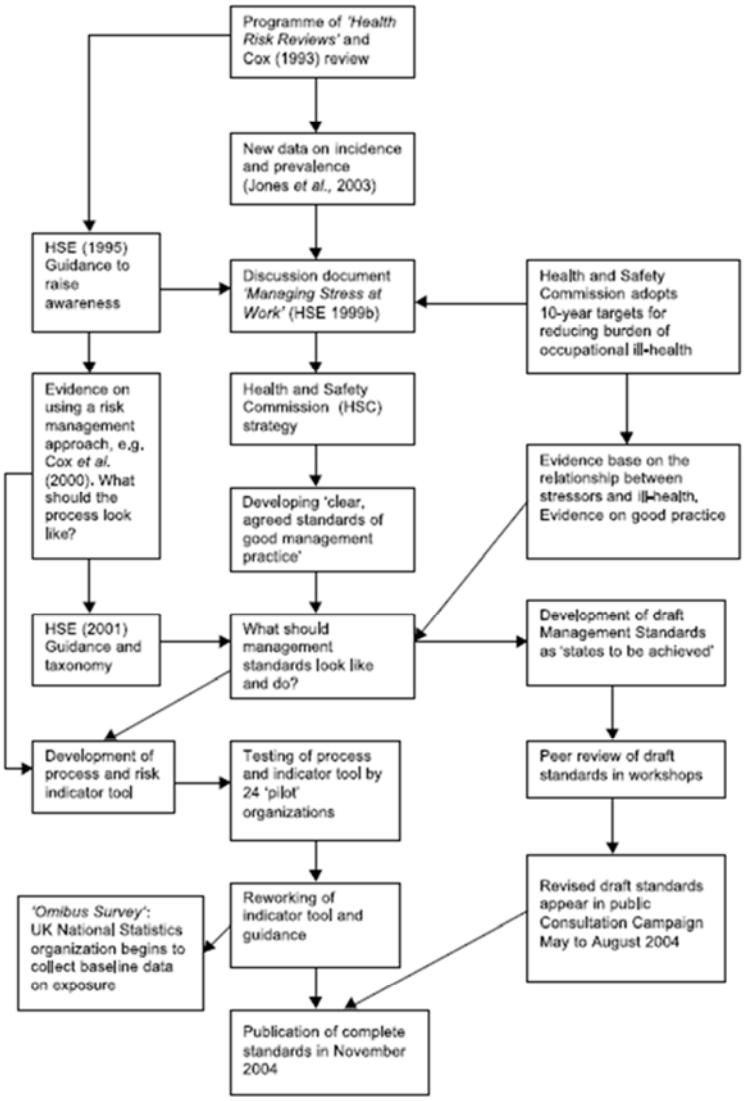
- Likert method: In the Likert method scores on the GHQ12 are summed to provide an overall score with a higher score indicative of greater Psychological Distress. Items are scored on a scale of 0-3 with a range of 0-36. Generally, the threshold can be taken as 11 or 12 with those scoring over 14 most likely requiring assistance (Goldberg & Williams, 1988; Mayhew & Chappell, 2003).
- GHQ12 Caseness: Items are scored on a 0-0-1-1 scale with a score range of 0-12. As with previous research, those scoring 4 or above were categorised as 'a probable case (i.e. those having a probable psychiatric illness)' (Tedstone et al., 2007; Scottish Health Survey 1995; 2003).

2.4.2 Sources of Stress

A detailed description of the theoretical foundation, and psychometric development of the HSE management standards and indicator tool can be found in two articles published in the Journal Work and Stress in 2004 (Cousins et al., 2004; Mackay et al., 2004). The process of development can be charted back to the early 1990's when the HSE identified workplace stress as the second most important health risk after

musculoskeletal problems (Mackay, 2004). A review of the scientific literature was commissioned by the HSE to identify health effects and to shed light on potential management approaches (Cox, 1993). This review identified the importance of stress and its management in occupational settings, providing particular evidence of a relationship between stress and ill-health (Cousins, 2004). Over the next decade a considered review and consultation process followed (see figure 8 below) and resulted in the creation of the HSE Indicator tool.

Figure 8 HSE Tool development



Central to this process was the idea of risk assessment and managing potential harm in the form of psychosocial stressors. The role of multiple stressors and accompanying theories in health and illness had been evidenced by large volumes of convincing research (e.g. the Whitehall 2 studies, Stansfield, Head, & Marmot, 2000; Van der Doef & Maes, 1999). The HSE Indicator tool sought to provide a unifying framework that incorporated these theories. Thus, it combined landmark theoretical frameworks, including early person-environment fit concepts relating to role and relationship stressors (French, 1973); Demand /control theory (Karasek, 1979); decision latitude & effort-reward imbalance models (Siegrist & Peter, 1994); and change and support models (House, 1981).

In this study sources of stress were measured using the HSE Stress Indicator Tool for Work Related Stress (HSE Indicator Tool Manual, 2004). This is a 35 item questionnaire that identifies sources of stress across established risk factors or 'psychosocial hazards' including Control, Demands, Role, Relationships, and Change. These are described alongside sample items in Table 8 below.

Table 8. Sources of Stress assessed by the HSE indicator

Source of Stress / Risk assessed	Sample item
Demands (Work environment; workload, work patterns.)	'I have to neglect some Tasks because I have too much to do'
Control (How much control the person has over work)	'I have some say over the way I work'
Support (Support from peers, management, the organisation including resources, encouragement etc.).	'I get help and support I need from colleagues.'
Relationships (Reported conflict; dealing with negative behaviour such as harassment & bullying; Positive working practices.)	'Relationships at work are strained'

Source of Stress / Risk assessed	Sample item
Role (Understanding & clarity of role within the organisation; conflicting roles.)	'I am clear about the goals and objectives for my department.'
Change (How change is managed and communicated.)	'When changes are made at work, I am clear how they will work out in practice.'

Developed specifically for use within UK organizations, the Indicator Tool assesses a range of stressors and provides an indication of how well an organisation is managing risks associated with occupational stress (HSE Indicator Tool manual, 2004). Benchmarks have been identified based on large scale research and result from comparisons with 'the performance of the top 20% of employers that are successfully minimising work-related stress' (HSE Indicator tool manual, 2004; Cousins et al., 2004; Mackay et al., 2004). Recent research suggests the predictive value of the measure in occupational settings (Guidi, Bagnara & Fichera, 2012). Appropriate factor structures are evident (Cousins et al, 2004; Edwards, Webster, Van Laar & Easton, 2008; Kerr, McHugh & McCrory, 2008). Cronbach alpha scores are within recommended ranges for Role (.83), Relationships (.78), Peer Support (.82), Managerial Support (.87), Control (.78), Demands (.89), and Change (.83) (Cousins et al., 2004; Mackay et al, 2004; Edwards et al., 2008).

2.4.3 Job Satisfaction

A single item measure of global job satisfaction was adopted for this study ('how do you feel about your job as a whole?'). This approach has been suggested in the literature (e.g., Wanous, Reichers & Hudy, 1997) and was deemed more appropriate than other lengthier and more time consuming scales. Single item measures of job

satisfaction have been used in similar settings (e.g. Winefield et al., 2002) and have been shown to correlate highly with multi-item job satisfaction scales (Wanous, Reichers & Hudy, 1997; Dolbier, Webster, McCalister & Steinhardt, 2005). In Winefield et al.'s (2002) study, this single item was strongly correlated with a multiple item job satisfaction scale (r = .8). In the current study, the single item measure correlated highly with Psychological Distress and sources of stress (Appendix 16) as could be expected of a good measure of job satisfaction.

2.4.4 IPIP 50 item Big Five Personality Inventory

This is a 50 item questionnaire assessing the five personality constructs of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Goldberg, 1999). This five factor model has been demonstrated to be stable regardless of nationality, age and gender groups (Erhart, Roesch, Ehrhart & Killian, 2008; Hough & Ones, 2001; Guenole & Chernyshenko, 2005; Goldberg et al., 2005; Donellan, Oswald, Baird & Lucas, 2006; Gow, Whiteman, Pattie & Deary, 2005). These studies show consistently that big five measures are psychometrically robust (valid, reliable). The International Personality Item Pool (IPIP) contains 10 items for each of the Big Five scales with Likert scale response categories with reliability ranging from .78 to .88 for the various scales and stable factor structures (Socha, Cooper & McCord, 2010; Donnellan et al., 2006).

Developed from the over 2000 items of the IPIP (Goldberg, 1999), the 50 item measure was created from items that correlate highly with the NEO PI-R (Costa &

McCrae, 1992). The correlation between the NEO PI-R scales and the IPIP scales is .73 (Goldberg, 2006).

2.4.5 The Coping Inventory for Stressful Situations

The Coping Inventory for Stressful Situations (CISS, Endler & Parker, 1990) is a 48 item self-report measure of coping. Three main coping strategies are measured, with 16 items each for Problem or Task-focused coping (Task), Emotion-focused coping (Emotion), and Avoidance-focused coping (Avoidance). Avoidance can be further broken down into distraction and social diversion scales. Scale items are randomly distributed to control for order effects.

The CISS asks respondents to assess the extent to which they engage certain coping behaviours when reacting to difficult or stressful situations. Respondents rate each item on a five point scale from (1) "*Not at all*" to (5) "*Very much*". Completing the CISS takes approximately 7-10 minutes.

Factor structures have been shown to be stable for the CISS subscales (Endler & Parker, 1990a; Cosway, Endler, Sadler & Deary, 2000), and good construct validity has been demonstrated (Endler & Parker, 1990a; 1990b). The internal reliability as measured by the Cronbach alphas of the scales range from .87 for the Task scale, .89 for the Emotion scale, and .82 for the Avoidance scale (Endler & Parker, 1992; Cosway et al., 2000; Connolly & Willock, 2009).

Several studies have subjected the CISS to factor analysis and found that Avoidance items tend to predict considerably less variance than the Task or Emotion items. For

example, the CISS manual show Task (16.2%) and Emotion (12.4%) items accounted for most of the variance with Avoidance items (7.7%). Previous research conducted by the researcher showed comparable figures of 17.7%, 14.7%, and 6.4% respectively (Connolly & Willock, 2009). In this previous research feedback from participants had questioned whether the measure needed to be as long as it was. Additionally, in several cases participants circled more than the required single response and this was followed by a missing response on the next item. This suggested that it would be beneficial to adapt the questionnaire to differentiate items.

In the current research it was therefore decided to adapt and test a short version of the CISS. A series of meetings were held with Dr. Joyce Willock, a representative from Queen Margaret University, an individual factors specialist with many years of experience with the CISS and other measures of coping. Together, twenty four items of the CISS were selected to create a shorter version, subsequently labelled the CISS 24. Items were differentiated (by shading alternate lines) to eliminate problems of double marking.

The current study subjected the CISS 24 to principal components analysis (PCA) using SPSS Version 19. Results of the analysis of CISS 24 are presented for Time 1 (N = 143). It should be noted that Time 2 had a smaller sample size of 116 which was considered too small for such procedures. There is much debate in the literature as to adequate sample sizes for Factor Analyses but the Time 2 sample size was less than the flexible criteria suggesting a minimum of 5 cases for each variable (in our case, 24x5=120 required) (Field, 2005). Analyses reveal a 3 factor solution accounting for 39% of the variance in the current measure. The use of a 19 item scale is suggested

for future research. Due to reasons of limited space and to facilitate readability, the details of the analysis are presented in the final Appendix.

2.5 Additional Questionnaire items

A separate questionnaire was included to gain information about pertinent demographic characteristics and lifestyle / coping behaviours that have been identified in the literature as important to employee stress and psychological distress. These included items on: age, gender, job classification, job status (part/full-time), marital status, nationality, type and frequency of exercise, alternative and complementary therapy usage, and counselling.

To facilitate inclusion in a variety of statistical analyses two questions assessed education on both continuous (years of education) and categorical levels (level completed).

The following open-ended questions were included to assess the perceived challenges, stressors and possible management strategies associated with the move. These questions allow respondents to include more information that may not be reflected in the rigid response categories offered by standardised questionnaires. These were included to allow feedback and to facilitate future management strategies within the University and in other organisations undergoing change. The questions limited responses to 3 issues to a) encourage more than one response and b) to impose a limit so as not to overburden the respondent or increase questionnaire length too much. Three questions were asked:

- What are 3 positive things you associate with the move?
- What are 3 negative things you associate with the move?
- What are the biggest cause(s) of stress for you associated with the move?

3 RESULTS

3.1 Structure of Results

Several different formats/structures were considered prior to finalizing this section. Data were available for three important groups:

- Employees participating at Time 1
- Employees participating at Time 2
- Employees participating at Time 1 and Time 2 (matched participants)

To facilitate ease of interpretation the results are structured in two main sections. The first section provides data on all participants at Time 1 and all participants at Time 2. It begins by providing descriptive data and analysis of the respondents at both time points. It then describes analyses relating to levels of Psychological Distress, job satisfaction and sources of stress and presents personality and coping data. Analyses of group differences in stress and Psychological Distress are then presented. Finally, the results of tests exploring the relationships between stress, Psychological Distress, personality and coping are presented.

The second section presents results from the longitudinal cohort (matched participants) and concerns itself primarily with the measurement of change. Open ended responses are also summarized in this section.

Notes on the presentation: Please note that percentage values are rounded throughout this section and are an expression of the entire responding population. To improve readability, percentages on missing data are not always displayed. They can however be

calculated based on the data provided. It is indicated throughout this section wherever statistical information has been included in the Appendices to improve manageability.

3.2 Data Management and Analysis

The Statistical Package for the Social Sciences (SPSS version 19) was used to analyse the data. Descriptive data can be seen at the beginning of the results section. Prior to analysis data were assessed for normality to determine appropriate statistical analyses.

Data were analysed using a variety of statistical techniques, namely, Spearman's correlations, Mann Whitney U tests, Chi-squared tests, t tests, and multiple regressions. Supporting information is presented in tabular format in the Appendices.

Effect sizes are reported where appropriate as has been recommended in the literature (Field, 2005; Kirk, 2006). Rosenthal's (1991, p.19) equation ($r=Z/(\sqrt{N})$) was used to calculate the effect size estimate.

The author's reference to 'strength' or 'size' of relationship is based on Cohen's (1988, 1992) interpretative guidelines:

r=.10: Small effect

r= .30: Medium effect

r=.50: Large effect

Following the data checking process and assessment of outliers, the distribution normality was assessed by examination of histograms, plots, skewness and kurtosis values, and tests of normality (Kolmogorov Smirnov).

Missing data were also evaluated. No patterns were identified using the SPSS missing values analysis program. Very little data was missing within any scales. Any missing data were judged to be missing at random and pairwise substitution of missing data was therefore selected for further analysis. The data were also checked for outliers, with any outliers found to have been due to initial inputting errors. These were rectified. Additional data checks were conducted on every 10^{th} inputted questionnaire to double check for inputting errors.

Several of the independent variables and the Dependent variable did not meet the criterion of parametric distribution for acceptance into a multivariable regression. Transformations were attempted. A ladder of powers for transformations for skewness was chosen to reflect the particular adjustment required, depending on the degree and direction of skew (De Vaus, 2002; Tabachnick & Fidell, 2006). These were unsuccessful.

Logically, the non-parametric variables could either be omitted or included in the regression analysis. Exclusion would result in a significant data discussion loss, and was the least desirable choice. Following discussions with statisticians at QMU it was decided to proceed with the use of parametric testing, treating the variables as if they were normally distributed. De Vaus (2004) argued on two grounds why this might be a valid procedure. He highlighted the fact that experimentation has found "less severe effects than previously thought" when normality assumptions are violated (p.78). Tabachnick & Fidell (2006) confirmed that in a large sample a "variable with statistically significant skewness often does not deviate enough from normality to make a substantive difference in the analysis" (p.80). They also pointed out that,

regardless of the distribution of the variables, sampling distribution means are normal if the sample is large enough. Lumley, Diehr, Emerson, and Lu Chen (2002) also suggest that normality is not likely the major limitation and provide demonstrations of this case in extremely non -normal data.

3.2.1 Rationale for the analyses

As Segerstrom (2012) discusses, referring to stressor consequences is useful in order to understand the impact of stressors (a primary goal of this study). Many studies have identified the direct effects of stress in predicting distress (Higgins & Endler, 1995; Sharpley & Yardley, 1999; Wilkinson et al., 2000; Beasley et al., 2003). This research has a particular interest in testing the ability of a relatively new stress measure (HSE Indicator tool) to predict outcome (distress). This approach followed the existing research on the HSE indicator tool and Psychological distress (Kerr et al., 2009; Gyllensten & Palmer, 2005), that of a main or direct effects model.

The way in which coping and personality influence the stress-distress relationship has been debated in the literature. Direct effect and indirect effect models have been proposed. Direct effect models predict that a variable (such as personality or coping) has direct effects on levels of distress. The indirect model proposes that the variable moderates or mediates between stress and distress (Aldwin & Revenson, 1987; Wilkinson, Walford, & Espnes, 2000).

Firstly, there is debate as to the potential moderating and mediating frameworks of coping and personality (Bolger & Zuckerman, 1995; Carver & O'Connor-Smith, 2010). Secondly, meta-analyses have shown Personality to directly predict distress

(Malouff et al. 2005). Similarly, studies have found that coping directly predicts distress (Beasley et al., 2003; Herman-Stahl & Petersen, 2006; Callan, Terry and Schweitzer, 1994). This research therefore adopts a direct effects model.

This approach is also supported by the context of our research. There is debate as to whether or not coping and personality are distinct entities. Studies have identified high correlations between the two constructs (Solberg, Nes, & Segerstrom 2006) and these correlations appear to be stronger in high intensity or enduring stress or distress contexts (Gomez et al. 1999, Moos & Holahan 2003, Murberg et al. 2002) and with dispositional measures. Our study represents such a stress intense context, and uses a dispositional measure. A direct effects model may therefore be more appropriate. We test the direct effects of stress, personality and coping, and subsequently conduct analyses to test whether the HSE measure is able to predict distress when these effects are controlled for.

3.3 Response breakdown

A breakdown of response rates can be seen in Table 9 below. Almost thirty per cent of the Time 1 sample returned questionnaires with a lower response rate of 23% in Time 2.

Of the 143 participants at Time 1, fifty eight went on to participate at Time 2. This represents a matched participant response rate of 41%. Therefore, a significant number of participants (n=58; 50%) in Time 2 were entirely new to the study. The

reason for this is not clear but there are several possibilities including staff turnover during relocation and/or the differing time points of distribution or (for example, vacations more likely in summer period, different workloads).

Table 9. Response breakdown

	Time 1	Time 2	Matched Participants
Eligible participants	500	500	143
Response (frequency)	143	116	58
Response rate (%)	29%	23%	41%

3.4 Participant profile and health behaviour

Table 10 below shows the overall participant profile at both time points and for matched participants.

Table 10. Participant Profile

	Description	Time1 Frequency (%)	Time2 Frequency (%)	Matched Participants
Gender	Male	37 (26%)	25 (22%)	10 (17%)
	Female	104 (73%)	90 (78%)	48 (83%)
Age	Mean Age	43yrs (SD=10)	42yrs (SD=11)	44yrs (SD=10)
	Age Range	22-63yrs	20-64yrs	24-64yrs
Marital Status	Married	74 (53%)	61 (54%)	32 (55%)
	Single	42 (30%)	36 (32%)	20 (34%)
	Widowed	3 (2%)	2 (2%)	1 (2%)
	Separated/	8 (6%)	7 (6%)	1 (2%)
	Divorced	-	-	-
	Remarried	3 (2%)	-	-
	Co-habiting	10 (7%)	7 (6%)	2 (3%)
Job Status	Full Time	109 (77%)	82 (72%)	39 (67%)
	Part Time	33 (23%)	32 (28%)	17 (29%)
Education	Primary	2 (1%)	-	-
	Secondary	11 (8%)	8 (7%)	4 (7%)

	Description	Time1 Frequency (%)	Time2 Frequency (%)	Matched Participants
	3rd Level	34 (25%	31 (27%)	16 (28%)
	Post Graduate	90 (65%)	74 (65%)	37 (64%)
Average years of education		18yrs	18yrs	18yrs
Nationality	Scotland & UK	120 (88%)	102 (88%)	52 (90%)
	Other	17 (12%)	14 (12%)	1 (2%)

The majority of participants (73-78%) were female, with an average age between forty and forty-five. Participants were more likely to be married (53-54%) or single(30-32%), with a small proportion identifying themselves as separated (6%), remarried (0-2%) or co-habiting (6-7%). As expected in a University population a high level of education is evident with an average of 18 years education in both T1 and T2 participants. Over 90% of participants had completed third level education or higher.

It is evident that participants from Time 1 and 2 tend to exhibit similar profiles. In fact inspection of percentages shows their profiles to be practically identical. There was a 5% decrease in the percentage of employees reporting full-time working status and an equivalent 5% increase in those reporting part-time status.

Clearly the age distribution is similar at both time points. While the average age remains the same, there is a slight increase in the number of younger people participating at time 2.

There is little difference between the characteristics of matched participants and respondents overall. The majority of participants (83%) were still female, with an average age between forty and forty-five. Participants tended to be married (55%) or single (34%) with a small proportion identifying themselves as separated (2%), remarried (2%) or co-habiting (3%).

There was a decrease in the number of employees reporting full-time working status (5%) and an equivalent increase in that reporting part-time employment status (5%). This change was more pronounced in matched participants who reported a proportional 10% decrease in full-time status when compared with overall Time 1 findings.

Table 11 below shows the overall response to questions relating to exercise, counselling, and use of CAM[3]. Between 3-5% of participants indicated they attend counselling/therapy with the majority indicating did not (94-97%).

Table 11 Usage of Exercise, Counselling, and CAM

	Description	Time 1 Frequency (%)	Time 2 Frequency (%)
Attend Counselling/therapy?	Yes	7 (5%)	5 (4%)
	No	135 (94%)	110 (95%)
Take physical exercise?	Yes	127 (89%)	103 (89%)
	No	15 (10%)	11 (9%)
Frequency of exercise (per week)	Once	11 (8%)	11 (9%)
	Twice	32 (22%)	24 (21%)
	Three	35 (24%)	29 (25%

[3] CAM = Complementary or Alternative Medicine

	Description	Time 1 Frequency (%)	Time 2 Frequency (%)
	Four	6 (4%)	5 (4%)
	[1]Five +	35 (24%)	30 (26%)
Number using CAM		42 (29%)	36 (31%)

**CAM primarily referred to Reflexology, Homeopathy, Massage, and Acupuncture. Recommended frequency of physical activity (Department of Health, 2004)*

As regards exercise the results demonstrate that 25% of participants are self-reporting that they are meeting the frequency guideline of 'five a week' recommended by the Department of Health (2004). In contrast 9% reported taking no exercise and 47% exercising once or twice per week.

3.5 Psychological Distress

3.5.1 Mean GHQ scores

Table 12 shows a slightly higher mean score of 14.7 following relocation (vs. 14.2 before relocation). Generally, the threshold can be taken as 11 or 12 with those scoring over 14 most likely requiring assistance (Goldberg & Williams, 1988; Mayhew & Chappell, 2003). National and international comparisons reveal higher mean scores for QMU staff.

Table 12 Psychological Distress Before and After Relocation (Mean GHQ scores)

	Mean	SD	N
After Relocation	14.7	7.04	110
Before Relocation	14.2	6.44	140
Psychological Distress in similar groups:			
Academic Staff (Winefield et al., 2002)	13.7	6	3753
General Staff (Winefield et al., 2002)	12.8	6	4714
Adelaide University Staff (Winefield & Jarrett, 2001)	12.2	5.9	1961

	Mean	SD	N
British University Staff (Daniels & Guppy, 1992)	11.3	4.7	221
University Teachers (Parkes, 1990)	9.1	5.2	157

Higher mean score indicates greater distress.

Figure 9 below shows in more detail the large number of participants with high GHQ scores. It is particularly useful in visually highlighting the number of cases that are above the threshold (indicated by the blue line at 11/12) and in the upper extremes (to the right of the chart). Additionally, it also shows that GHQ scores were similarly distributed at both time points. In line with this a one sample t- test revealed no statistical difference between mean scores [t (109) =.785, p=.434, SE=.672].

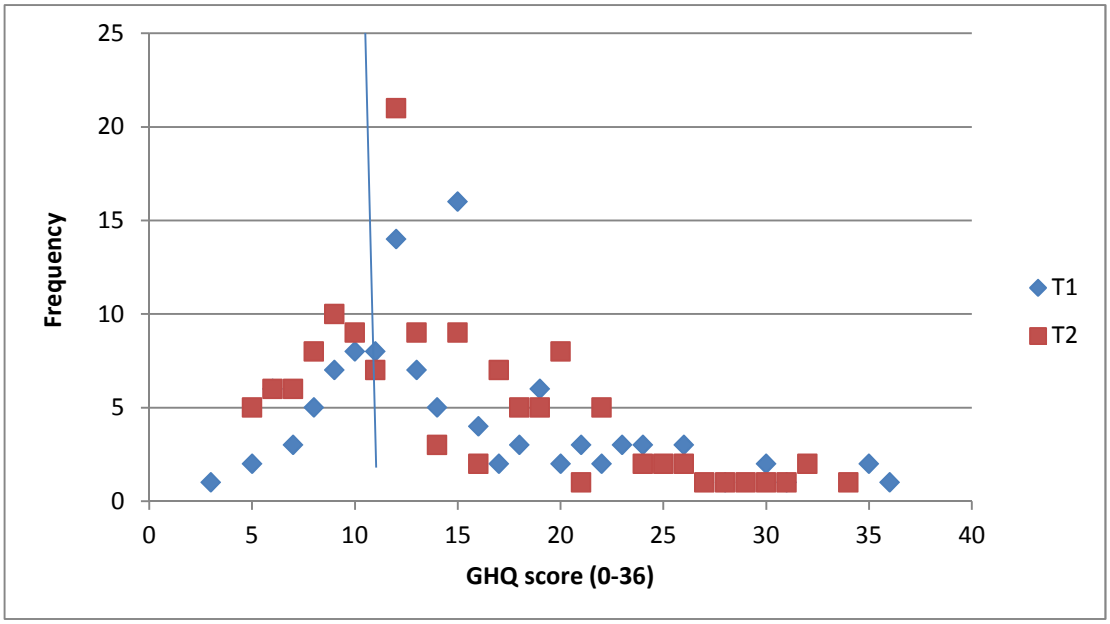


Figure 9. Frequency Distribution of GHQ scores at T1 and T2

3.5.2 Degree and prevalence of Psychological Distress

Figure 10 below shows that 38% (n=42) of QMU staff are currently classified as probable cases indicating considerable Psychological Distress. This percentage has remained relatively stable when compared to pre-relocation figures, and remains higher than population norms and similar staff groupings.

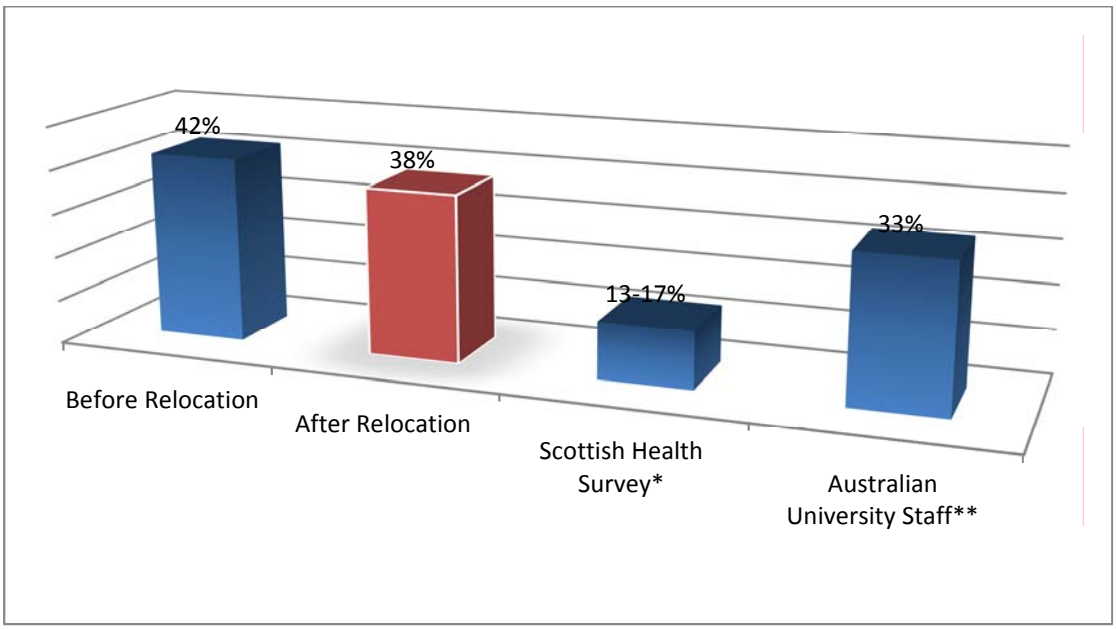


Figure 10. Psychological caseness[1]

*Those having a probable psychiatric illness (scoring >/= 4) (Tedstone et al., 2007; Scottish Health Survey, 1995; 2003) *Scottish health Survey, 2008 **Winefield et al., 2002*

Using the cut-off point of 12 a one sample t- test showed a significant difference in mean GHQ scores for the study group when compared to population norms at T1 [$t(139)=-4.067$, $p<.001$] and at T2 [$t(109)=4.061$, $p<.001$].

In fact the prevalence and degree of Psychological Distress in QMU appears to be higher than several high risk occupations such as health sector staff, including emergency response ambulance personnel (Mayhew & Chappell, 2003).

Analyses of group differences at individual time points (see Appendices 10-21) in mean GHQ scores revealed no significant differences between academic and non-academic staff at T1 ($U=2078$, $Z=-.101$, $p>.05$) or at T2 ($U=1132$, $Z=-1.430$, $p>.05$). The hypothesis that academic employees would have higher levels of Psychological Distress than non-academic employees was rejected (H_8). There were no differences

in Distress between male and female staff at T1 (U=1709, Z=-.615, P>.05) or at T2 (U=1015, -.037, p>.05). The hypothesis that female employees would have higher levels of Distress than male employees (H_9) was rejected.

Table 13 below shows that 27 Academic staff (39%) and 23 (40%) non-academic staff were identified as cases at T1. At T2 59% (25) of Academic employees were identified as cases (vs. 40% (17) for non-academics). This is a 19% increase in the number of academic staff reporting Psychological Distress since relocation. Further analyses by job title are not presented to protect anonymity. There were no significant differences between male and female staff.

Table 13. Psychological Caseness pre & post relocation

	All staff	Academic	Non-academic	Male	Female
After Relocation	38% ↓	59% ↑	40% ↑	42% ↓	38% ↓
Before Relocation	42%	40%	39%	44%	41%

Indicates an increase in prevalence following relocation

The results in the above section also related to two primary predictions (H_1 & H_2). The hypothesis that the group under study would have a significantly reduced psychological distress when compared with the general population and other occupational groups was accepted (H_1). The hypothesis that Psychological Distress would be significantly higher following relocation was rejected (H_2).

3.6 Job Satisfaction

Figure 11 below shows that 55% of participants were satisfied at T1 and 57% were satisfied at T2. It also shows that 39% were unsure or dissatisfied at T1 (compared to 44% at T2).

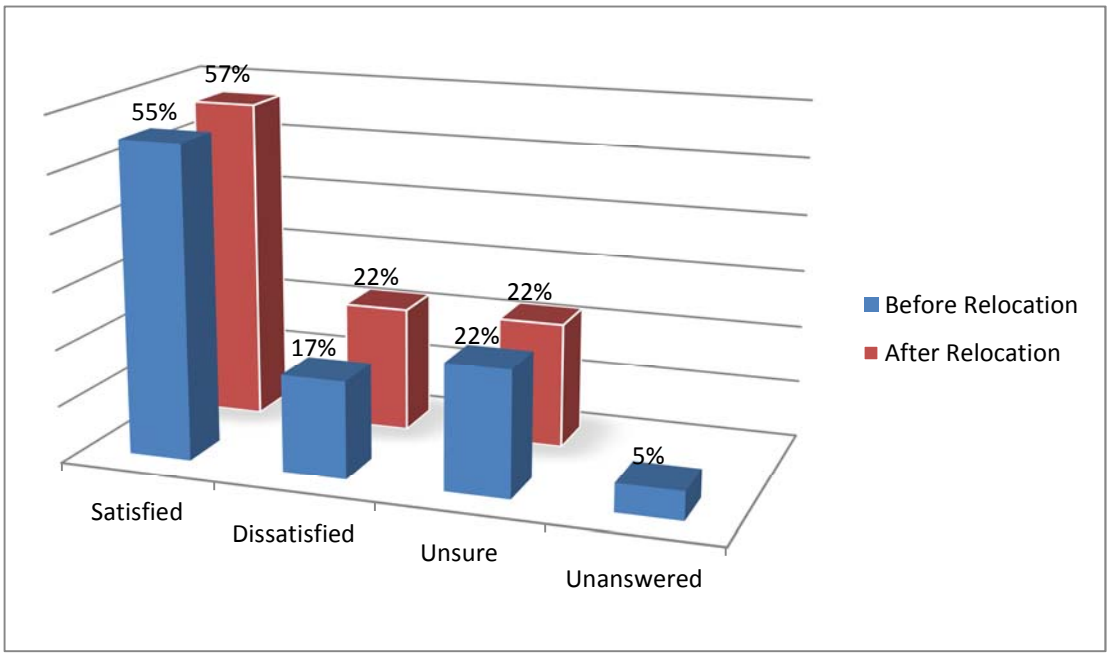


Figure 11. How do you feel about your job as a whole?

Appendices 19 & 20 present a detailed breakdown and results of analyses of job satisfaction by group. In line with findings from Time 1, analysis of group differences in satisfaction levels at T2 revealed no significant differences between academic and non-academic staff [$x^2(2)=3.596$, $p=.166$] or between male and female staff [$x^2(2)=3.558$, $p=.169$].

Appendix 19 & 20 show that there was a slight increase (4.5%) in the number of non-academics reporting being satisfied from before (N= 34) to after (N = 39).

3.7 Sources of Stress

The results show (Table 14 below) that the greatest sources of stress were in the areas of Change, Demands and Managers Support. Following relocation, Change remained the greatest source of stress reported by staff. Generally, the Sources of stress remained the same pre and post relocation.

Table 14 Sources of stress before and after relocation

	Before Relocation	After Relocation	SD	N
Change	2.71	2.79	.86	115
Demands	3.12	3.06	.76	113
Managers Support	3.38	3.31	.9	115
Peer Support	3.75	3.7	.65	115
Control	3.85	3.72	.69	115
Relationships	3.87	3.79	.75	114
Role	3.89	3.8	.72	115

*Lower score indicates greater source of stress *See Appendix 17 for Time 1 SD/N*

Participant responses to each question on the HSE Stress Indicator Tool for Work Related Stress are presented in Table 15 below. For comparative purposes and to facilitate interpretation these responses are also graphically displayed in Appendix 17-18 (p. 240-43). Questions relating to Change and Demands were consistently rated as the greatest stressors. Table 14 shows that 28% of staff did not feel that they had sufficient opportunities to question managers about change at work; just over 51% disagreed staff are always consulted about change at work, and 36% disagreed with

the statement that ‘when changes are made at work, I am clear how they will work out in practice.’ Higher levels of peer support are reported with 75% agreeing or strongly agreeing that they ‘get help and support they need from colleagues’.

Table 15 Sources of Stress Questionnaire Item response (%) after Relocation (a)

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	
I get help and support I need from colleagues		6.1	19.1	57.4	17.4	Peer Support
I have some say over the way I work	1.7	3.5	13	60	21.7	Control
I have sufficient opportunities to question managers about change at work	8.7	19.1	27	40	5.2	Change
I receive the respect at work I deserve from my colleagues	0.9	8.7	30.4	48.7	11.3	Peer Support
Staff are always consulted about change at work	21.7	29.6	32.2	13.9	2.6	Change
I can talk to my Line Manager about something that has upset or annoyed me about work	4.3	13	16.5	48.7	17.4	Manager Support
My working time can be flexible	2.6	12.2	16.5	48.7	20	Control
My colleagues are willing to listen to my work related problems	0.9	4.3	25.2	57.4	12.2	Peer Support
When changes are made at work, I am clear how they will work out in practice	7.8	28.7	41.7	20	1.7	Change
I am supported through emotionally demanding work	8.7	18.3	41.7	26.1	5.2	Manager Support
Relationships at work are strained	2.6	17.4	32.2	35.7	12.2	Relationships

My Line Manager encourages me at my work	7.8	12.2	28.7	37.4	13.9	Manager Support

**Continued in Table 15 below. Responses from before relocation can be seen in Appendix 21*

Table 16 below shows that regarding Demands, 61% of staff responded 'sometimes,' 'often,' or 'always ' to the statement indicating that 'different groups at work demand things from me that are hard to combine.' A further 38% indicated having to neglect some Tasks because of having too much to do, and a large proportion reported having to work very intensively (49%) and having to work very fast (84%) on the same basis. Over three quarters (76%) reported that they 'sometimes,', 'often,' or 'always' had unachievable deadlines.

It is particularly notable as regards relationship stress, that 29.6% of employees reported that they were sometimes, often or always subject to personal harassment. Some 59.7% of employees reported friction between colleagues and 16.5% of employees reported being sometimes, often or always bullied.

Table 16. Sources of Stress Questionnaire Item response % after Relocation (b)

Question	Never	Seldom	Sometimes	Often	Always	Stressor
I am clear what is expected of me at work	1.7	6.1	21.7	50.4	20	Role
I can decide when to take a break	0.9	5.2	13.8	38.8	40.5	Control
Different groups at work demand things from me that are hard to combine	5.3	18.6	40.7	26.5	8.8	Demands
I know how to go about getting my job done	0.9	3.5	13	59.1	23.5	Role

Question	Never	Seldom	Sometimes	Often	Always	Stressor
I am subject to personal harassment in the form of unkind words or behaviour	46.1	24.3	20.9	7	1.7	Relationships
I have unachievable deadlines	4.3	19.1	31.3	33	12.2	Demands
If work gets difficult, my colleagues will help me	1.7	8.7	35.7	34.8	19.1	Peer Support
I am given supportive feedback on the work I do	7.8	17.4	44.3	21.7	8.7	Manager Support
I have to work very intensively	13.9	37.4	38.3	9.6	0.9	Demands
I have a say in my own work speed	2.6	9.6	31.3	47	9.6	Control
I am clear what my duties and responsibilities are	2.6	4.3	19.1	53	20.9	Role
I have to neglect some Tasks because I have too much to do	5.2	20.9	4.9	22.6	10.4	Demands
I am clear about the goals and objectives for my department	6.1	4.3	29.6	43.5	16.5	Role
There is friction or anger between colleagues	6.1	34.2	47.4	7.9	4.4	Relationships
I have a choice in deciding how I do my work	4.3	2.6	27.8	46.1	19.1	Control
I am unable to take sufficient breaks	18.3	34.8	30.4	13.8	2.6	Demands
I understand how my work fits into the overall aim of the organisation	5.2	4.3	19.1	53.9	17.4	Role
I am pressured to work long hours	24.3	24.3	25.2	20	6.1	Demands
I have a choice in deciding what I do at work	3.5	14.8	35.7	39.1	7	Control
I have to work very fast	1.7	14.8	49.6	25.2	8.7	Demands
I am subject to bullying at work	64.3	19.1	13.9	1.7	0.9	Relationships
I have unrealistic time pressures	13.9	32.2	32.2	15.7	6.1	Demands

Question	Never	Seldom	Sometimes	Often	Always	Stressor
I can rely on my Line Manager to help me out with a work problem	6.1	13	27	33	20.9	Manager Support

3.8 Personality and coping

Mean and median scores for coping and personality dimensions following relocation are presented in Table 17 below. It should be noted that the concept of a personality 'norm' may not be appropriate or meaningful in some cases (i.e. there is no such thing as an average or normal personality). Mean scores allow for analysis and comparisons.

Inspection of Table 17 shows the similarity in mean scores of both coping and personality dimensions at both T1 and T2. Detailed examination of changes from T1 to T2 is presented in the matched participants section.

Table 17 Coping and Personality mean scores Variable

	Dimension	Mean	Median	SD
Personality	Extraversion	T1=32.86 T2=32.19	T1=34 T2=32	6.56 6.80
	Agreeableness	T1=42.01 T2=41.50	T1=42 T2=42	4.90 5.29
	Conscientiousness	T1=35.23 T2=36.35	T1=36 T2=37	5.48 5.83
	Neuroticism	T1=28.38 T2=29.12	T1=28 T2=27	7.41 7.82
	Openness	T1=38.19 T2=37.39	T1=38 T2=37	5.43 5.85
Coping	Problem based coping	T1=31.02 T2=30.78	T1=31 T2=32	3.96 4.28
	Emotion based coping	T1=21.87 T2=21.62	T1=22 T2=22	4.55 5.30
	Avoidance based coping	T1=22.84 T2=23.80	T1=23 T2=24	4.83 4.87

3.8.1 Group differences

Analysis of group differences at both time points revealed similar findings.

Following relocation Academic staff reported significantly greater demands and significantly greater manager support than non-academic staff. It is notable that there has been a shift, since relocation, in differences between academic and non-academic staff across stressors. Before relocation academic staff tended to report greater stress across almost all stressors, only doing slightly better on control. Following relocation this is no longer the case with academic staff reporting significantly more manager support and greater control than non-academic staff. However they also report significantly greater Demands than non-academic staff.

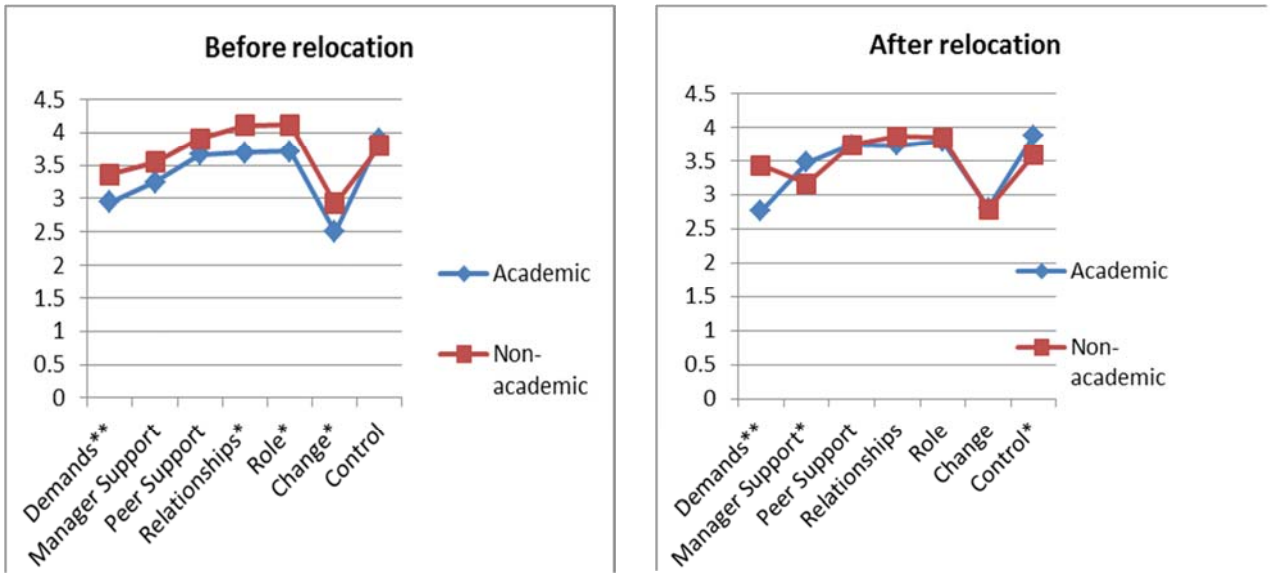


Figure 12. Sources of stress by staff grouping (mean score)

In line with findings from Time 1 (Appendix 19-20, p.244), stress and Psychological Distress scores at Time 2 revealed few significant differences between academic and non-academic staff or between male and female staff.

Table 18. Differences between academic and non-academic staff groups after relocation

	Academic[b]	Non-academic [b]	N	Test statistics	Z	P	R
Mean GHQ score	16.04	13.7	104	U=1132.00	-1.430	.153	-
Probable Psychiatric 'case' [a]	25 (59%)	17 (40%)		X2(1)=2.2067		.151	-
Non-Case	28 (45%)	34 (55%)					
Job Satisfaction			110	X2(2)=2.201		.333	-
Satisfied	33 (52%)	31 (48%)					
Dissatisfied	14 (61%)	9 (39%)					
Unsure	56 (51%)	54 (49%)					
Stressor (mean rank):							
Demands	43.39	65.22	109	U=-846.50	-3.642	.000**	-.35
Manager Support	62.14	47.73	109	U=1092.50	-2.386	.017*	-.23
Peer Support	58.96	50.96	109	U=1267.00	-1.333	.183	-
Relationships	55.99	52.95	108	U=1375.50	-.508	.612	-
Role	53.56	56.46	109	U=1406.00	-.482	.630	-
Change	57.17	52.79	109	U=1365.50	-.729	.466	-
Control	61.31	48.57	109	U=1138.00	-2.112	.035*	-.20

**sig at .05 level **sig at .001 level*
[a]*Probable case (>/=4); Non-Case (<4)*
[b]*Academic category refers to Lecturers, Professors, Research Fellows; Researchers*

A significant but small difference was identified as regards role, with men reporting greater role stress than women.

Table 19. Differences between Male and Female Staff Groups after relocation

	Male	Female	N	Test statistics	Z	P	R[b]
Mean GHQ score	15.2 (n=24)	14.6 (n=85)	109	U=1015.0	-.037	.971	-
Probable Psychiatric 'case' [a]	10 (42%)	32 (38%)	109	X2(1)=.128	-	.721	-
Non-Case	14 (58%)	53 (62%)					
Job Satisfaction			115	X2(2)=3.301	-	.192	-
Satisfied	14 (56%)	52 (58%)					
Dissatisfied	8 32%)	16 (18%)					
Unsure	3 (12%)	22 (24%)					
Stressor (mean rank)							
Demands	57.94	51.23	112	U=929.5	-.898	.369	-
Manager Support	55.02	58.20	114	U=1050.5	-.426	.670	-
Peer Support[b]	58.74	57.15	114	U=1081.5	-.215	.830	-
Relationships	53.28	58.06	113	U=1007.0	-.648	.517	-
Role	45.98	60.74	114	U=824.5	-.1.986	.047*	-.186
Change	57.48	57.51	114	U=1112	-.003	.997	-
Control	58.14	57.32	114	U=1096.5	-.110	.912	-

**Sig at .05 level*

[a]Probable case (>/=4); Non-Case (<4);[b]Please note that R is the effect size estimate, which was calculated from Rosenthal's (199, p.191) equation.

3.9 Relationships

A series of statistical tests were conducted to explore the relationships between Psychological distress, Sources of Stress, Personality and Coping. For example, in the case of Psychological Distress, correlations presented in Tables 20-21 help answer the following questions:

At both time points, what is the relationship between Psychological Distress and:

- Stress?
- Personality?
- Coping?
- Education?
- Age?
- Marital status?

Due to the large number of correlations, the results from T1 are presented in separate tables from T2. Main Tables are presented and interpretation is provided in between these tables.

3.9.1 Relationships with Psychological Distress

Table 20. Spearman's Rho Correlations with GHQ12 (at T1)

	N	Rho	P
Age	135	.209*	0.015
Education	135	-.119	.169
Demands	138	-.430**	.000
Control	138	-.452**	.011
Manager's Support	138	-.479**	.000
Peer Support	138	-.404**	.000
Relationships	138	-.583**	.000
Role	138	-.386**	.000
Change	137	-.454**	.000
P-Openness	137	.081	.347
P-Conscientiousness	139	-.094	.270
P-Extraversion	130	-.053	.551
P-Agreeableness	136	-.085	.324
P-Neuroticism	132	.354**	.000
C-Problem	127	-.119	.181
C-Emotion	138	-.267**	.002
C-Avoidance	137	-.103	.230

***Correlation is significant at the .01 level *Correlation is significant at the .05 level; r^2 has been calculated to demonstrate strength of relationship*

A series of correlations showed that both before and after relocation all sources of stress (Demands, Control, Managers' Support, Peer Support, Relationships, Role and Change) were significantly correlated with Psychological Distress. Table 20, Table 21, and Figure 15 below show that high levels of stress were strongly associated (rho>/=.35 in all cases) with higher GHQ scores at both time points. That is, participants reporting more stress tended to have higher levels of Psychological

Distress. The hypothesis that higher levels of stress would be associated with higher levels of Psychological Distress was therefore accepted (H_4).

Table 21. Spearman's Rho Correlations with GHQ12 (at T2)

	N	Rho	P
Age	105	.174	0.076
Education	108	.073	.456
Demands	108	-.456**	.000
Control	109	-.472**	.000
Manager's Support	109	-.352**	.000
Peer Support	109	-.363**	.000
Relationships	108	-.583**	.000
Role	109	-.485**	.000
Change	109	-.389**	.000
P-Openness	110	.025	.794
P-Conscientiousness	109	-.090	.350
P-Extraversion	-110	-.204*	.033
P-Agreeableness	107	-.045	.643
P-Neuroticism	106	.599**	.000
C-Problem	102	-.338**	.001
C-Emotion	104	.525**	.000
C-Avoidance	102	-.073	.465

***Correlation is significant at the .01 level *Correlation is significant at the .05 level; r^2 has been calculated to demonstrate strength of relationship*

The strongest correlations at both time points were between Relationships and Psychological Distress. Lower scores on relationships (i.e. 'worse ' scores) were strongly associated with higher Psychological Distress at T1 (rho=-.583, p<.01) and at T2 (rho=-.583, p<.01). Figure 13 below presents a scatterplot in order to graphically show this relationship.

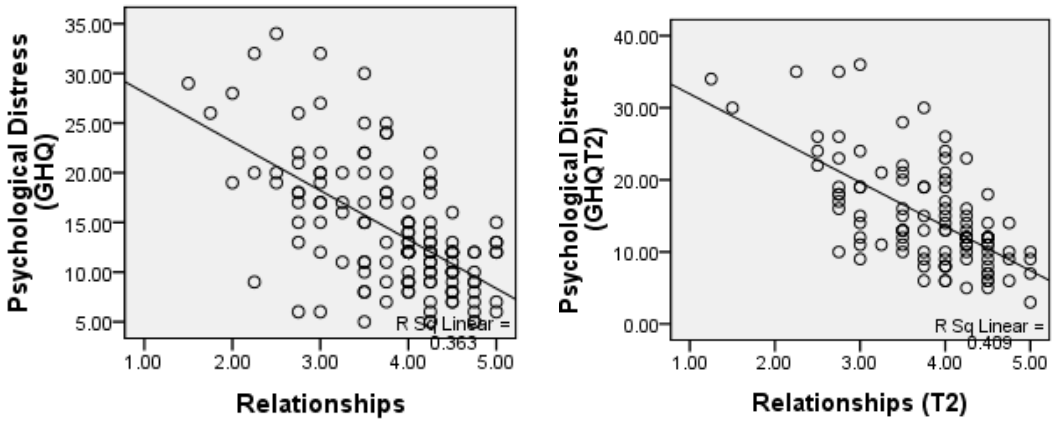


Figure 13. Scatterplot of relationship between Relationship stress and Psychological Distress at T1 and T2

Job satisfaction was also correlated with psychological distress. Employees who reported being less satisfied tended to report more psychological distress. There was a significant difference in Psychological Distress (GHQ score) between those who reported being satisfied versus dissatisfied with their job as a whole at T1 (H (3) =15.13, p=.001) and at T2 (H (1) =39.00, p=.000). The hypothesis that low levels of job satisfaction would be correlated with higher levels of Psychological Distress was accepted (H_3).

Several items were flagged as 'urgent' by the HSE's indicator tool. There was a significant relationship between these items and Psychological Distress. Poorer ratings of these items were associated with greater Psychological Distress (Appendix 16).

As regards personality and Psychological Distress, Neuroticism was significantly associated with Psychological Distress both before (rho=.354, p<.01) and after

relocation (rho=.599, p<.01). This represented a medium to large effect and can be seen in the scatterplots in Figure 14 below. That is, participants with higher levels of Neuroticism tended to report higher levels of Psychological Distress. The hypothesis that Neuroticism would associated with higher levels of distress (H_{5a}) was accepted.

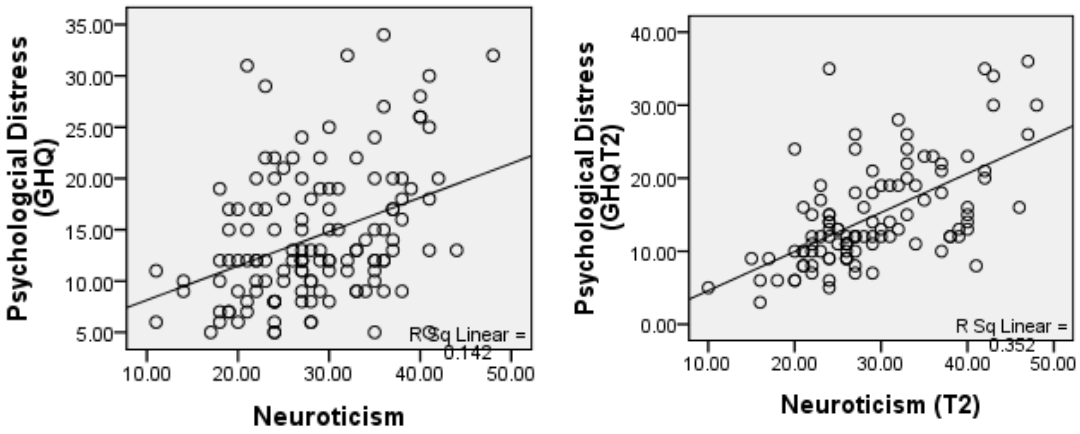


Figure 14. Scatterplot showing significant relationship between Neuroticism and Psychological Distress at T1 and T2

No significant relationships were identified between Psychological distress and Openness, Conscientiousness or Agreeableness at either time point. The hypotheses that these personality dimensions would be associated with Psychological Distress were rejected ($H_{5c\text{-}e}$). A small but significant relationship was identified between Psychological Distress and Extraversion at T2 (rho=-.204, p<.05). The hypothesis that Extraversion would be associated with Psychological Distress was partially supported (H_{5b}).

As regards coping, Figure 15 shows a significant relationship between Emotion-focused coping and Psychological Distress at both time points. A medium sized

relationship was identified at T1 (rho=.267, p<.01) and a large or strong relationship identified at T2 (rho=.525, p<.01). That is, participants with higher levels of Emotion focused coping tended to have lower levels of Psychological Distress. The hypothesis that higher Emotion focused coping would be significantly related to higher levels of Psychological Distress (H_6) was accepted.

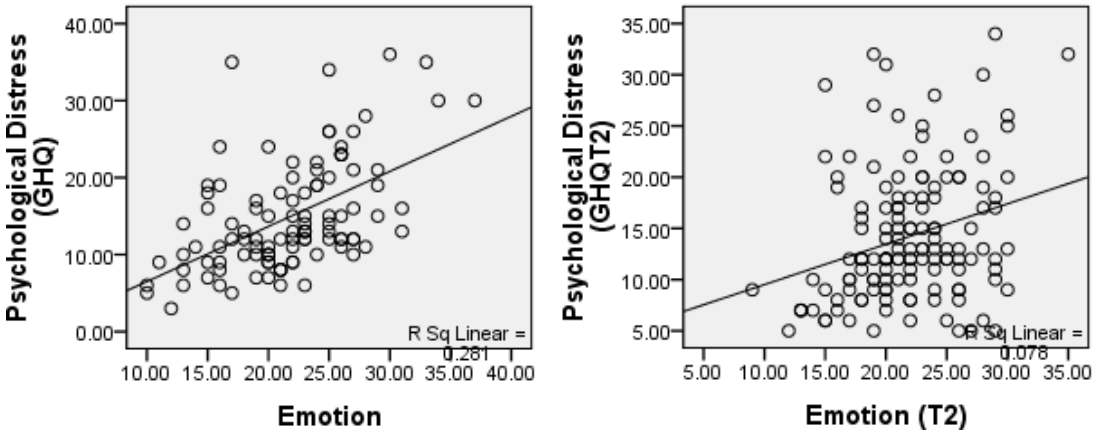


Figure 15. Scatterplots of Emotion focused coping and Psychological Distress at T1 and T2

Problem focused coping was also significantly related to Psychological Distress (Figure 16 below) with a medium sized effect at T2 (rho.-338, p<.01) but no relationship at T1. The hypothesis that higher Problem focused coping would be associated with lower Psychological Distress (H_7) was accepted at T2. No significant relationships were identified between Avoidance focused coping and Psychological Distress at either time point.

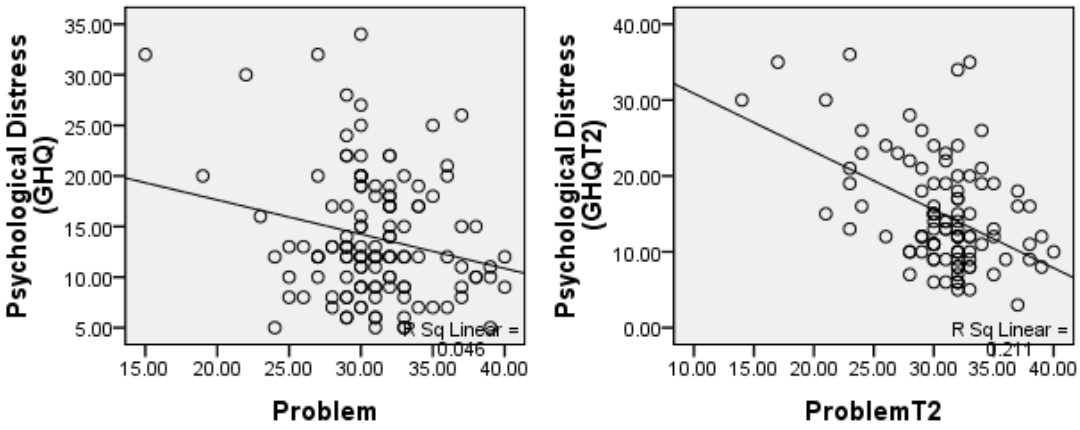


Figure 16. Scatterplots of Problem focused coping and Psychological Distress at T1 and T2

Several additional relationships were identified. The variables of age, gender, education, job title, marital status, use of alternative and complementary therapy, and the use of counselling and exercise were analysed at both time-points to examine potential relationships with the variables of Psychological Distress, sources of stress and job satisfaction.

No relationship was found between education and Psychological Distress at T1 (rho=-.119, p>.05) or at T2 (rho=.073, p>.05).

A significant relationship between age and Psychological Distress was identified at T1 (Table 20 above). To examine this further we collapsed age into quartile categories. Table 22 below clearly shows that as age increases so too does Psychological Distress with the under 35 age group appearing to have the lowest mean scores.

Table 22. Age and Psychological Distress at T1

Age	Mean	N	Std. Deviation
<=35	12.9706	34	4.76404
35-42	13.3889	36	6.72852
43-50	15.5938	32	7.30823
50+	15.8788	33	6.58007
Total	14.4148	135	6.46389

The hypothesis that as age increases Psychological Distress will decrease (H_{12}) was rejected. No relationship was found between education and distress at either time points or between exercise and distress at T1 (rho=-.112, n = 119; p>.05).

A series of Mann-Whitney U tests were conducted (See appendices 21 and 22) to assess the differences between additional variables of marital status, use of counselling and use of CAM. There were no significant differences between married and unmarried employees at T1 (U = 2471, P>.05) or at T2 (U = 1165, p>.05). The hypothesis that married employees would have less Psychological Distress than unmarried employees (H_{11}) was rejected.

There were no significant differences between married and unmarried employees regarding Psychological Distress or the stressors of Demands, Managers support, Peer support, Relationships, Role or Change or Control. However at T2 a significant difference was identified solely between marital status and Peer support (p<.05; U = 1901) with married employees reporting worse scores (married group, N=61, mean = 3.63, SD = .66; unmarried group, N = 51, mean = 3.87, SD =.59).

Exercise was not correlated with any source of stress, with Psychological Distress or job satisfaction at T1. At T2 employees who exercised more frequently reported better Relationships (rho=.234, p<.05, n=97) and less Psychological Distress (rho=-.310, p<.05, n=94). Exercise frequency was also associated with Emotion focused coping (rho=-.261, p<.05, n=93) and Neuroticism (rho=-.244, p<.019, n=93). Employees with higher levels of Neuroticism and Emotion focused coping tend to exercise less frequently.

A small but significant relationship between exercise and Extraversion was found at T1 (rho=-.189, p<.05, n=112) but not at T2 (rho=.176, p>.05, n =98).

Analysis of the relationship between CAM users revealed no significant relationships with any outcome variable (Appendix 22). Analysis of counselling and stress and satisfaction was not possible due to the small and unequal numbers within this group (N=7 at T2).

3.9.2 Relationships with personality

Table 23 below and Table 24 (p.121) show results of correlational analysis with personality variables.

Table 23. Spearman's Rho Correlations with Personality (at T1)

		Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Age	Corr. Coefficient	.012	.015	-.111	-.084	-.013
	P	.888	.863	.217	.337	.882
	N	134	135	126	132	130
Education	Corr. Coefficient	.395**	-.136	.381**	.144	-.007
	P	.000	.114	.000	.097	.938
	N	136	137	127	134	130
Demands	Corr. Coefficient	-.252**	-.051	-.139	-.023	-.021

		Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
	P	.003	.552	.116	.793	.815
	N	137	139	129	136	131
Control	Corr. coefficient	.119	-.026	.111	.105	-.252**
	P	.165	.783	.212	.226	.004
	N	138	139	129	136	131
Manager's Support	Corr. Coefficient	-.217	.057	-.133	.052	-.291**
	P	.011	.504	.132	.542	.001
	N	137	139	129	137	131
Peer Support	Corr. Coefficient	-.062	.014	-.111	.196*	-.142
	P	.474	.868	.209	.022	.107
	N	137	139	129	136	131
Relationships	Corr. Coefficient	-.185*	.072	-.052	.024	-.291**
	P	.030	.401	.558	.785	.000
	N	137	139	129	136	138
Role	Corr. Coefficient	-.087	.137	-.174*	-.030	-.223*
	P	.310	.107	.049	.725	.011
	N	137	139	129	136	131
Change	Corr. Coefficient	-.277**	.095	-.145	.139	-.257**
	P	.001	.267	.104	.107	.003
	N	137	138	128	135	131
C-Problem	Corr. Coefficient	.365**	.359**	.165	.214*	-.331**
	P	.000	.000	.070	.015	.000
	N	127	128	120	126	122
C-Emotion	Corr. Coefficient	.005	-.356**	-.225**	-.021	.693**
	P	.957	.000	.010	.805	.000
	N	137	139	130	136	131
C-Avoidance	Corr. Coefficient	.106	-.053	.092	.081	.024
	P	.219	.534	.299	.347	.781
	N	137	139	130	137	132

**Correlation is significant at the .05 level; **Correlation is significant at the .01 level*

Previously we saw that Neuroticism was the primary personality dimension significantly associated with Psychological Distress. It is evident from Tables 22 and 23 that Neuroticism is also associated with a large number of stress variables at both time points. Higher levels of Neuroticism are significantly related with Control both before (rho=-.252, p<.01) and after (rho= -.324, p<.01); with Relationships both before (rho=-.291, p<.01) and after (rho=-.367, p<.01); with Role both before (r=-.223, p<.01) and after (rho=.411, p<.01); and with Change both before (rho=-.257, p<.01) and after (rho=-.299, p<.01). It is significantly associated with Demands after (but not before) relocation (rho=-.310, p<.01). Similarly, Neuroticism is significantly associated with Peer Support after (rho=-.239, p<.01) but not before relocation. Clearly those with higher Neuroticism scores tend to report higher levels of stress, reporting poorer Relationships, less control and more change related stress at both time points. The hypotheses that personality would be associated with stress ($_{H8a\text{-}e}$) were partially supported, except in relation to Conscientiousness (H_{8c}) which was rejected.

At T1 higher levels of Openness were associated with Demands (rho=-.252, P<.01), Relationships (rho=-.185, P<.05) and Change (rho=--.277, p<.01). These represent relatively small associations and we see from Table 24 that none of these relationships were evident at T2.

Conscientiousness was not associated with any source of stress at T1 or T2. A small but significant association was identified between Extraversion and Role stress at T1 (r=-.174, p<.05) but not a t T2 (r=-.046, p>.05).

Those with higher levels of Agreeableness tended to report greater Peer Support at T1 (rho=.196, p<.05) but not at T2 (rho=-.016, p>.05). Agreeableness was also associated with change at T2 (rho=.199, p<.05). That is, participants higher in Agreeableness tended to report less Change related stress.

Table 24. Spearman's Rho Correlations with Personality (at T2)

		Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Age	Corr. coefficient	-.104	-.067	-.061	.023	-.030
	P	.278	.487	.527	.813	.763
	N	105	109	110	107	106
Education	Corr. coefficient	.359**	.159	.180	.062	.147
	P	.000	.057	.057	.522	.129
	N	112	.096	112	109	108
Demands	Corr. coefficient	-.143	.125	-.020	-.033	-.310**
	P	.131	.192	.832	.731	.001
	N	112	111	112	108	107
Control	Corr. coefficient	.105	-.026	-.051	.057	-.324**
	P	.266	.784	.588	,554	.001
	N	114	113	114	111	109
Manager's Support	Corr. coefficient	-.007	-.071	-.036	.136	.089
	P	.938	.456	.706	.156	.356
	N	114	113	114	111	109
Peer Support	Corr. coefficient	.031	.035	-.016	.172	-.239*
	P	.746	.710	.866	.070	.012

		Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
	N	114	113	114	111	109
Relationships	Corr. coefficient	-.008	-.079	-.019	-.015	-.367**
	P	.934	.407	.839	.880	.000
	N	113	112	113	110	108
Role	Corr. coefficient	-.049	.121	-.046	.077	-.411**
	P	.604	.203	.628	.424	.000
	N	114	113	114	111	109
Change	Corr. coefficient	-.078	.018	.001	.199*	-.299**
	P	.409	.815	.988	.036	.002
	N	114	113	114	111	109
C-Problem	Corr. coefficient	.402**	.326**	.388**	.205*	-.418**
	P	.000	.001	.000	.038	.000
	N	106	106	106	103	101
C-Emotion	Corr. coefficient	-.090	-.279**	-.393**	-.153	.705**
	P	.356	.003	.000	.119	.000
	N	108	108	108	105	103
C-Avoidance	Corr. coefficient	.026	-.013	.126	.014	-.027
	P	.793	.894	.198	.886	.791
	N	106	106	106	103	101

**Correlation is significant at the .05 level; **Correlation is significant at the .01 level*

A significant relationship was identified between education and Openness both before (rho=.395, p<.01) and after (rho=.359, p<.01) relocation. That is, participants with higher levels of education tended to have higher levels of Openness.

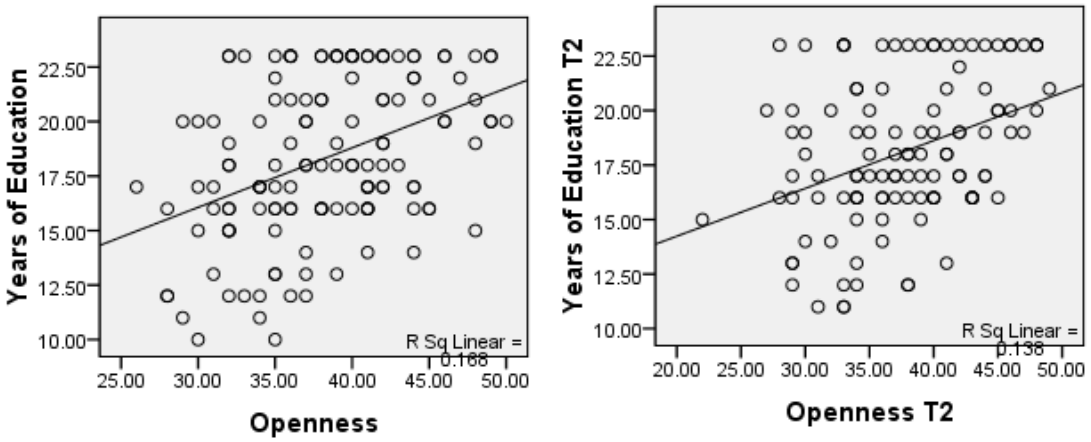


Figure 17. Openness and Education

Similarly, Extraversion was significantly associated with education at T1 (rho=.381, p<.01). No significant relationships were identified between any personality dimension and age at either time point.

As regards coping, the results in Table 22 and Table 23 (above) show that Avoidance was not associated with any personality dimension at either time point.

Problem focused coping was associated with Openness at T1 (rho=.365, p<.01) and T2(rho=.402, p<.01), with Conscientiousness at T1 (rho=.359, p<.01) and T2 (rho=.326, p<.01), with Agreeableness at T1 (rho=.214, p<.05) and T2 (rho=.205, p<.05), and with Neuroticism at T1 (rho=-.331, p<.01) and T2 (rho=-.418, p<.01). It

was associated with Extraversion at T2 (rho=.388, p<.01) but not at T1 (rho=.165, p>.05).

These represent medium to strong positive correlations in the majority of cases. However, in the case of Neuroticism strong negative correlations are evident. It can be seen from the scatterplots below that participants with higher Problem focused coping tend to have lower levels of Neuroticism.

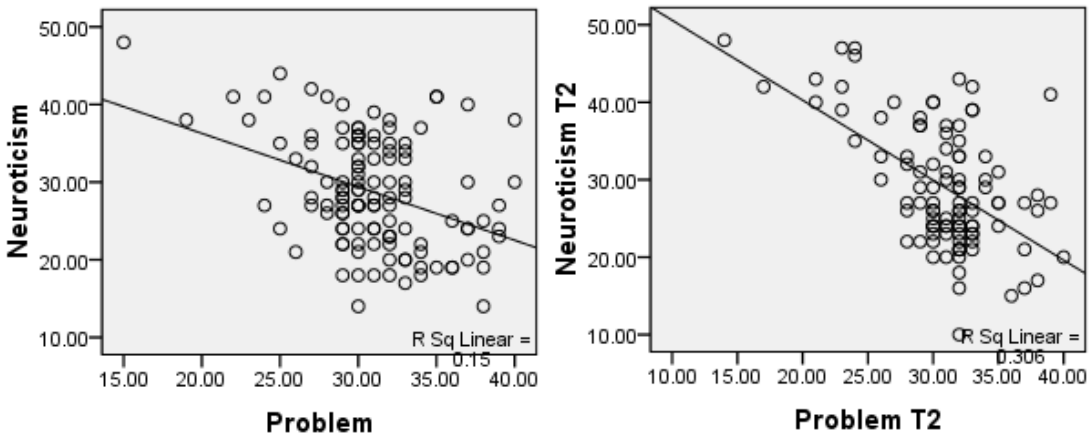


Figure 18. Scatterplots of Neuroticism and Problem focused coping

Emotion focused coping was associated with Conscientiousness at T1 (rho=-.356, p<.01) and T2 (rho=-.279, p<.01), with Extraversion at T1 (rho=-.225, p<.01) and T2 (rho=-.393, p<.01) and with Neuroticism at T1 (rho=.693, p<.01) and T2 (rho=.705, P<.01). No relationships were identified between Emotion focused coping and Openness or Agreeableness at either time point.

Participants with high Emotion focused coping tended to have lower levels of Conscientiousness and Extraversion.

The results show that the strongest correlations between any coping and personality dimension are that of Emotion focused coping and Neuroticism. As Emotion focused coping increases, so too does Neuroticism. The scatter plots in Figure 19 graphically demonstrate the strength and clarity of this relationship.

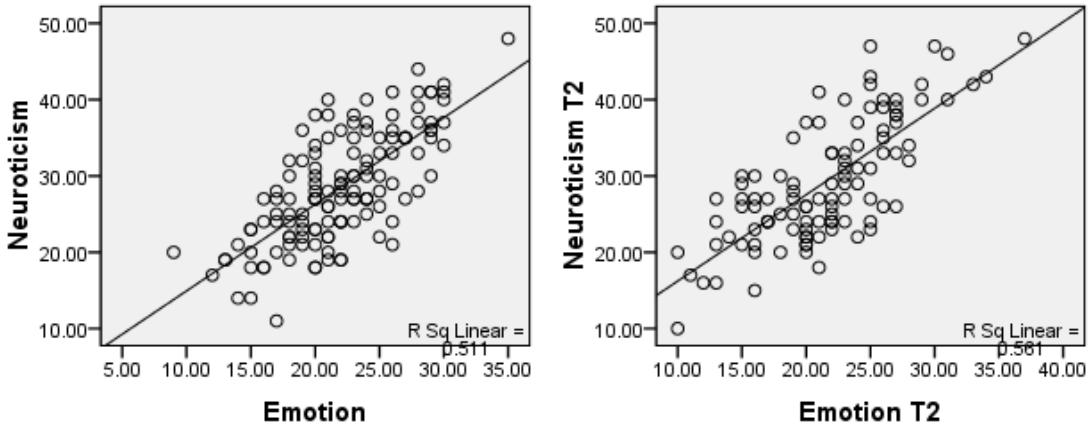


Figure 19. Scatterplots of Emotion focused coping

Emotion focused coping was significantly associated with Problem focused coping at T1 (rho=-.276, p<.01) and at T2 (rho=-.476, p<.01). This would be expected of a good coping measure, for as Emotion focused coping increases Problem focused coping decreases. There was no significant correlation between Avoidance and emotion at T1 (rho=.093, p>.05) or T2 (rho=.041, p>.05) or between Avoidance and Problem at T1 (rho=.038, p>.05) or T2 (rho=.079, p>.05).

3.10 Multivariate analyses

3.10.1 Standard multiple regression of stress and Psychological Distress

In line with the existing research examining the relationship between the HSE Indicator tool and Psychological Distress (Kerr et al., 2009; Gyllensten & Palmer,

2005) standard multiple regressions were conducted to examine whether the HSE stressors were predictive of levels of Psychological Distress. The seven stressors acted as the predictor or independent variables and Psychological Distress as the dependent variable. Standard multiple regression was carried out to address the following questions:

- How well do the sources of stress identified in the HSE stress measure predict Psychological Distress?
- Which source (s) of stress are the best predictors of Psychological Distress?

In Appendix 27 the coefficient table figures for Tolerance and VIF, multi-collinearity problems were ruled out. The normal probability plot suggested no major deviations from normality and the residual scatterplot scores identified no major deviation or outlier problems [defined by Tabachnick and Fidell (2001) as more than 3.3. or less than -3.3]. Analyses of residual statistics suggested no problems (maximum Cook's distance was .087).

Table 25. Regression model summary and ANOVA results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668[a]	.447	.417	4.92006

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2522.346	7	360.335	14.886	.000[a]
	Residual	3122.702	129	24.207		
	Total	5645.048	136			

The ANOVA summary in Table 25 shows the model as a whole is significant [F (7, 129 = 14.88, p<.05)]. Adjusted R square confirms that 41.7% of Psychological Distress variance is explained by the stress variable set (sig, p<.05). Of these seven variables Relationship stress makes the largest unique contribution (See Appendix 28; Beta = -.333, sig, p<.05), although Control also made a statistically significant contribution (Beta = -.173, sig, p<.05). Relationships stress predicts 5.1% of the variance in Psychological Distress (part correlation = -.226) while control predicts 2.04% of the variance (part correlation = -.143). This highlights that as a set these variables are considerably more predictive of outcome than they are individually.

3.10.2 Hierarchical regression including Personality, Coping, and age

Hierarchical regressions were then conducted while controlling for several pre-specified variables. Initial bivariate analyses conducted in the previous sections showed that the IV's (sources of stress) had the strongest correlations with Psychological distress at both time points. After this, Neuroticism (at T1, rho=.354; at T2 .599), Emotion focused coping (at T1, rho = -.267; at T2, rho = -.525) and Problem focused coping (at T1, rho = -.119; at T2, rho = -.338) were significantly correlated to outcome. Age was also significantly correlated with Psychological distress at time 1 (rho =.209). The literature has also identified these factors as influencing the stress-psychological distress relationship. We therefore conducted Hierarchical regressions to assess what these variables add to the prediction of the dependent variable after the IV's have been controlled for. Specifically, this would address the following question:

- If we control for the possible effect of personality, coping, and age, is our set of variables (Stress) still able to predict a significant amount of the variance in perceived stress?

Table 26. Model summary and ANOVA for Hierarchical regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.442[a]	.196	.168	5.87575	.196	7.119	4	117	.000
2	.717[b]	.514	.465	4.71164	.318	10.280	7	110	.000

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	983.073	4	245.768	7.119	.000[a]
	Residual	4039.360	117	34.524		
	Total	5022.433	121			
2	Regression	2580.487	11	234.590	10.567	.000[b]
	Residual	2441.946	110	22.200		
	Total	5022.433	121			

The ANOVA summary in Table 26 shows the model as a whole is significant [F (11, 110) = 10.57, p<.0005)]. After the variables in Block 1 (Neuroticism, Problem & Emotion focused coping, age) have been entered the model explains 19.6% of the variance. After Block 2 variables (Stressors) have also been entered the model as a whole explains 51.4% of the variance. The HSE stressors explain an additional 31.8% (R square change = 31.8) of the variance in Psychological Distress even when the effects of Neuroticism, Coping and age are statistically controlled for. The coefficient Table (27) shows that Relationships again make the largest unique contribution (Beta = -.292, p<.005) and Demands also significantly contributes (Beta = -.201, p<.05).

These unique contributions are small in relation to the shared variance predicted by the stressors, for Relationships 3.76% (part correlation = -.194), and for Demands 2.62% (part correlation = -.162). This again suggests the importance of the set in predicting Psychological Distress.

Table 27. Hierarchical coefficients table

Coefficients[a]											
		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.463	6.904		.212	.833					
	Age in years	.142	.054	.222	2.647	.009	.223	.238	.219	.978	1.023
	Neuroticism	.283	.106	.325	2.674	.009	.377	.240	.222	.465	2.149
	Emotion	.062	.170	.044	.364	.717	.279	.034	.030	.477	2.094
	Problem	-.087	.148	-.054	-.588	.558	-.214	-.054	-.049	.831	1.204
2	(Constant)	37.909	7.256		5.224	.000					
	Age in years	.050	.045	.079	1.110	.269	.223	.105	.074	.880	1.137
	Neuroticism	.049	.092	.057	.534	.595	.377	.051	.035	.391	2.558
	Emotion	.180	.141	.127	1.276	.205	.279	.121	.085	.443	2.257
	Problem	-.235	.131	-.145	-1.799	.075	-.214	-.169	-.120	.684	1.462
	Demands	-1.695	.698	-.201	-2.430	.017	-.398	-.226	-.162	.646	1.549
	Control	-1.486	.842	-.144	-1.764	.080	-.439	-.166	-.117	.666	1.501
	Mgr Support	-.573	.799	-.081	-.717	.475	-.502	-.068	-.048	.350	2.859
	Peersupport	-.667	.869	-.070	-.768	.444	-.456	-.073	-.051	.525	1.905
	Relationships	-2.455	.839	-.292	-2.925	.004	-.602	-.269	-.194	.444	2.255
	Role	.748	.903	.083	.829	.409	-.424	.079	.055	.436	2.293
	Change	-.764	.630	-.113	-1.212	.228	-.462	-.115	-.081	.509	1.965

In summary, these findings show that the sources of stress identified in the HSE Indicator predict a significant amount of variance in Psychological Distress even after controlling for personality, age and coping variables.

3.11 Matched participants

This section presents findings relating to those subjects that participated both before and after Relocation. This allows more conclusive evaluation of any change arising between time points.

3.11.1 Change in Psychological Distress

As was the case in the overall findings section, high levels of Psychological Distress were evident in matched participants.

Table 28. Psychological Distress in matched pairs

	Mean	SD	N
Matched Pairs after Relocation	15.07	7.44	58
Matched Pairs before Relocation	14.41	6.37	56
All participants:			
After Relocation	14.7	7.04	110
Before Relocation	14.2	6.44	140

It can be seen from Table 29 below that this increase does not reach statistical significance with no significant change in scores from T1 (Mean = 14.41) to T2 (Mean = 15.07). The hypothesis that Psychological Distress would be significantly higher after relocation than before was therefore rejected.

Table 29. Change in Psychological distress

Question	Variable assessed at T1 & T2	Distribution	Test	Mean	Median	SD	Statistic	P	Answer
Is there a change in participants' Psychological distress from T1 to T2?	GHQ Likert scores	NP	Wilcoxon Signed-Rank test	T1=14.41 T2=15.07	T1=13 T2=13	6.37 7.44	Z=-.526	.599	**No change**

At T1 45% (n=25) of matched participants were identified as psychological cases vs. 46% (n=27) at T2. It is interesting to note that psychological caseness is higher in matched participants than for the overall sample. Following relocation, 46% per cent of matched participants were identified as cases as opposed to 38% in the overall sample.

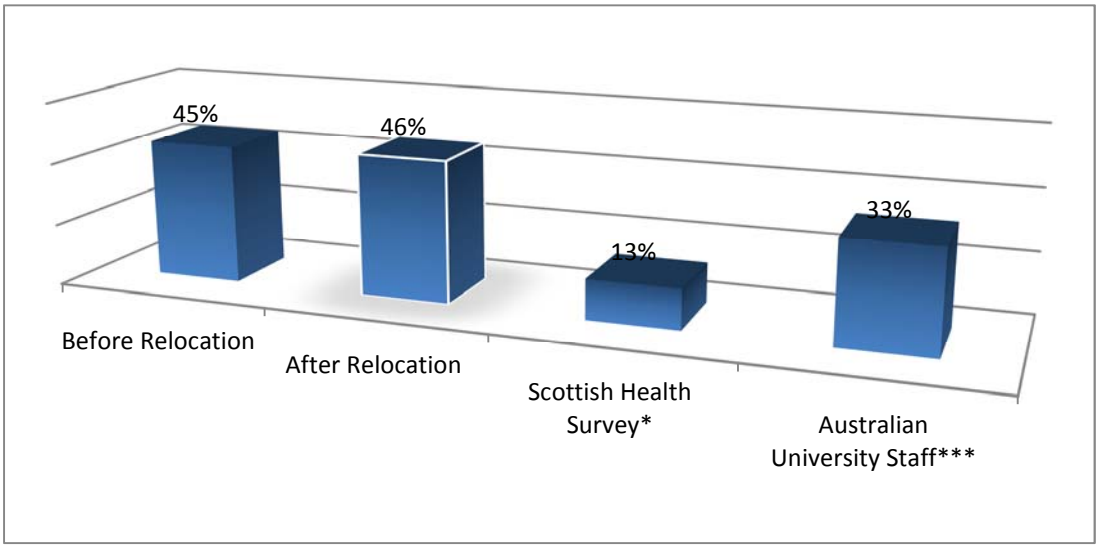


Figure 20. Psychological caseness in matched participants %

3.11.2 Change in sources of stress, coping, and personality

In order to assess any change in sources of stress from T1 to T2 a series of Wilcoxon signed-rank and t-tests were conducted.

Table 30 below shows that all sources of stress except control remained stable from T1 to T2. That is, participants reported significantly lower levels of control after relocation (Z=2.371, p<.05). Following calculation[4], this corresponds to a small effect size (r= .22). The only other significant change was an increase in Conscientiousness from T1 to T2.

Table 30. Analysis of matched participants at T1 and T2

Question	Variable assessed at T1 & T2	Distribution[1]	Test	Mean	Median	SD	Statistic	P	Answer
Is there a change in participants' stress scores from T1 to T2?	Demands	P	Paired samples t-test	T1=3.06 T2=3.00	T1=3.2 T2=3.1	.81 ..85	T=.965	.339	No change
	Control	NP	Wilcoxon Signed-Rank test	T1=3.89 T2=3.67	T1=3.8 T2=3.8	.61 .69	Z=-2.371	.018	*Change
	Managers Support	P	Paired samples t-test	T1=3.47 T2=3.33	T1=.3.4 T2=3.4	.81 .97	T=.965	.140	No change
	Peer Support	NP	Wilcoxon Signed-Rank test	T1=3.87 T2=3.76	T1=3.7 T2=3.9	.56 .66	Z=-1.258	.209	No change
	Relationships	NP	Wilcoxon Signed-Rank test	T1=3.81 T2=3.73	T1=4 T2=4	.68 .79	Z=-1.100	.271	No change
	Role	NP	Wilcoxon Signed-Rank test	T1=3.87 T2=3.73	T1=3.9 T2=3.8	.71 .72	Z=-1.695	.090	No change
	Change	P	Paired samples t-test	T1=2.78 T2=2.56	T1=2.7 T2=2.5	.95 ..88	T=1.972	.054	No change
Is there a change in participants	Problem based coping	NP	Wilcoxon Signed-Rank test	T1=30.9 T2=30.7	T1=30 T2=32	3.65 4.55	Z=-.574	.566	No change

[4] Calculation based on Rosenthal's (1991, p.19) equation (r=Z/(√N))

Question	Variable assessed at T1 & T2	Distribution[1]	Test	Mean	Median	SD	Statistic	P	Answer
coping styles from T1 to T2?	Emotion based coping	NP	Wilcoxon Signed-Rank test	T1=22.3 T2=21.9	T1=22 T2=22	4.28 4.95	Z=-.785	.432	No change
	Avoidance based coping	NP	Wilcoxon Signed-Rank test	T1=22.8 T2=23.2	T1=23 T2=23	4.47 4.73	Z=-.088	.930	No change
Is there a change in personality from T1 to T2?	Openness	NP	Wilcoxon Signed-Rank test	T1=39 T2=38.3	T1=39 T2=39	5.28 5.27	Z=-1.255	.209	No change
	Conscientious-ness	NP	Wilcoxon Signed-Rank test	T1=35.3 T2=36.1	T1=36 T2=36	6.74 6.26	Z=-2.083	.037	*Change
	Extraversion	NP	Wilcoxon Signed-Rank test	T1=32 T2=32.1	T1=31 T2=31	6.23 5.87	Z=-.255	.799	No change
	Agreeableness	NP	Wilcoxon Signed-Rank test	T1=41.5 T2=41.7	T1=42 T2=42	4.95 4.57	Z=-.999	.318	No change
	Neuroticism	NP	Wilcoxon Signed-Rank test	T1=29 T2=29.3	T1=27 T2=27	7.35 7.79	Z=-.108	.914	No change

**Significant at the p<.05 level; All figures rounded to 2 decimal points Significant at the p<.001 level*

3.12 Qualitative responses to open-ended items

A thematic analysis conducted to identify patterns in responses to the open ended questions in the questionnaire (Boyatzis, 1998). Responses were first extracted and collated in an excel file, and then a stepped but reiterative analysis was conducted (Braun & Clarke, 2008):

- Familiarisation (reading and re-reading).
- Coding or labelling.
- Searching themes.
- Reviewing themes and re-checking themes against the data set.
- Defining and naming themes.
- Writing up the themes.

3.13 Positive aspects of relocation:

Employees were asked what aspects of relocation they viewed as positive. Several overarching themes and subthemes emerged from thematic analysis of the data.

3.13.1 Benefits of the new physical environment

3.13.1.1 *An environmentally friendly campus*

Many participants felt that the new campus offered the benefit of being more environmentally friendly than the current campus. Participants consistently referred to the 'green campus' as a key positive associated with the move, describing the new campus as 'more efficient' and 'less wasteful'.

3.13.1.2 *Leaving behind an ageing campus*

Employees felt that leaving behind an 'old' and 'ageing' campus was a considerable benefit of moving. They referred to problems with 'heating', lighting', 'poor ventilation', and 'out-dated facilities' in the old campus. Many were looking forward to 'not having to deal with these issues on a daily basis'.

3.13.1.3 *Improved facilities*

Employees consistently referred to the 'new' and 'improved' campus and the accompanying 'modern' and 'up to date' facilities. Participants felt that more modern 'technology', 'equipment' and 'resources' would be a considerable improvement to the social and working environment.

3.13.2 An improved social environment

Employees consistently stated that one positive aspect of the move was the interaction that the open plan layout would create. They felt it offered a good opportunity to get to know more colleagues & staff within and across different departments. There was 'more opportunity for integration' and 'dialogue' with new staff. Additionally, some employees cited the benefit of joining a new community both to the University and the local community.

3.13.3 Unification of QMU campuses

In line with this another positive aspect associated with the move was the merging of the three distinct QMU campuses. Many employees described the benefit of 'a sense of togetherness' that would arise from 'being altogether' and 'under one roof'.

3.13.4 A better teaching environment

Many employees referred to the benefits of teaching associated with the move. Several employees felt there would be 'new opportunities to change and develop teaching practices' in the new campus. Many felt that new learning technologies would improve the teaching environment for students and teachers.

3.13.5 A new beginning

Many participants felt that a positive factor in moving to the new campus was that it offered opportunity for a 'fresh start'. One participant felt it would 'offer opportunities to experience new challenges and change'. Others thought it was exciting and looked forward to something different, to change. Many employees noted the opportunity to get organised & tidy and to clear out their office/space.

3.14 Negative aspects of relocation:

Employees were asked a) what the biggest causes of stress were and b) what the negative things they associated with the move were. Responses to these two questions generally fell into the same categories and are reported as such (i.e. those aspects of the move that employees reported as negative were also reported as the biggest causes of stress).

3.14.1 Communication

3.14.1.1 *A lack of information*

Employees reported a lack of information as a considerable source of stress. Several employees reported a lack, or inappropriate timing of information in regards to

timetables and parking arrangements as stressful. New campus practicalities were often reported as a source of stress, for example, not being informed about the personal working environment (location, access, and amount of space), and general procedures of the new campus.

3.14.1.2 *Uncertainty*

Many employees reported uncertainty as a considerable source of stress associated with the move. For several, 'coping with not knowing' was stressful. Many reported that this uncertainty stemmed from a lack of information as to how things will work generally in the new campus. Several employees reported being uncertain about how to use new systems and technologies or worried about knowing their way around the new physical layout.

3.14.1.3 *Communication from management*

Several employees were unhappy with the communication and consultation process from management. One employee stated they were unhappy with 'misinformation from senior managers'; another with 'the managements total lack of concern for the massive effect on the financial and spiritual Psychological distress of staff'; another stating that it was, 'Consultation disguised- in reality it was 'non consultation''.

3.14.2 Transport issues

3.14.2.1 *Increased cost*

Employees consistently reported issues relating to travelling to and from the University as an issue. Many felt that travel costs would be significantly higher and identified this as a negative factor associated with the move. One participant said that

she was worried she could not afford the increased cost. Others were unhappy with the lack of compensation for the additional cost.

3.14.2.2 *Increased travel time and implications*

The impact of travel on personal and family time was described as stressful by several employees. These felt that the additional distance meant that they would not be able to cycle or walk to work anymore and that this was a negative factor. Some felt that the extra travel time would 'eat in to relaxation time' or that they would have less time to spend with family. One employee said that this would lead to stress at home. Several employees felt that they would have difficulty getting home to pick up young children and that there also may be increased childcare costs as a result.

3.14.2.3 *Uncertainty of transport*

Uncertainty as to whether parking permits would be available and the lack of parking facilities at the new campus were reported as a negative factor associated with the move. Additionally, not knowing how much travel would cost and concerns about the quality of transport links were reported as stressful by several employees.

3.14.3 The implications of the new physical layout

Employees reported issues relating to the new physical environment as a cause of stress. The most common concern was simply 'the open plan environment'. Not having enough or the same amount of personal or shared space in the new building was an issue for several employees. Common stressors reported were the potential noise, sharing a desk, distraction, and lack of privacy in the new open plan layout.

One employee felt that the environment would stifle academic creativity. Several employees stated that being separated from students was also a disadvantage.

3.14.4 The attitudes and response of colleagues

One common theme identified was that the attitudes of colleagues had the potential to be a source of stress during the move. One participant response summed up the theme well when saying that the biggest negative associated with the move was: 'the negative views expressed by others and lack of effort to see positive side of relocation'. Scepticism amongst colleagues was a clear issue for several employees. For one employee the biggest negative associated with the move was 'academics anxiety about open plan/lack of space, and other negative feelings/scepticism'. In line with this theme was the stress of seeing the 'worry and upset of friends and colleagues'.

Many of these themes add to the quantitative findings of the survey and are likely to be useful for organisations undergoing similar relocation. They also lend support to the levels of stress identified in the HSE indicator tool. For example, uncertainty is further emphasized by the results of the HSE Sources of Stress Analysis Tool. The HSE tool highlighted nearly all aspects of 'role' as requiring urgent action, scoring below the 20th percentile (see HSE Indicator Tool results that follow). This reflects comparatively low scores on questions such as 'I am clear what is expected of me at work' and 'I am clear about the goals and objectives for my department'

3.15 Summary of Hypotheses testing results

The findings relating to each hypothesis have been presented throughout the results. Before moving to the discussion section the acceptance or rejection of hypotheses is summarized in Table 31 below.

Table 31. Summary of Hypothesis testing results

Hypothesis	Accepted/rejected
H_1: The group under study would have a significantly higher Psychological Distress compared with the general population and other occupational groups.	Accepted
H_2: Psychological Distress would be significantly higher following relocation.	Rejected
H_3: Low levels of job satisfaction would be correlated with higher levels of Psychological Distress.	Accepted
H_4: Higher levels of stress would be associated with higher levels of Psychological Distress.	Accepted
H_{5a}: Higher levels of Neuroticism would be associated with higher levels of Psychological Distress.	Accepted
H_{5b} Higher levels of Extraversion would be associated with higher levels of Psychological Distress.	Rejected at T1 Accepted at T2
H_{5c} Higher levels of Openness would be associated with higher levels of Psychological Distress.	Rejected
H_{5d} Higher levels of Conscientiousness would be associated with higher Psychological Distress.	Rejected
H_{5e} Higher levels of Agreeableness would be associated with higher Psychological Distress.	Rejected
H_6: Higher Emotion focused coping would be significantly related to higher levels of Psychological Distress.	Accepted
H_7: Higher Problem focused coping would be associated with lower Psychological Distress.	Rejected at T1 Accepted at T2
$H_{8a-e)}$: H_8: Personality dimensions would be associated with sources of stress.	Multiple analyses (see Discussion)

Hypothesis	Accepted/rejected
H_9: Academic employees would have higher levels of Psychological Distress than non-academic employees.	Rejected
H_{10}: Female employees would have higher levels of Distress than male employees.	Rejected
H_{11}: Married employees would be less distressed than unmarried employees.	Rejected
H_{12}: That age would be negatively correlated with Psychological Distress. That is, as age increases Psychological Distress will decrease.	Rejected

4 DISCUSSION

4.1 Structure of Discussion

This study investigated stress, psychological distress, personality and coping at Queen Margaret University. Hypotheses were developed to evaluate different types and effects of stress, and relationships between stress and coping, personality, and demographic variables, and these are elaborated below. Hypotheses were tested in relation to Time 1 and Time 2 data and acceptance or rejection are summarised in section 3.15 (p. 141) and integrated throughout this discussion. The discussion section is structured according to the following headings:

- Summary of key findings
- Prevalence and degree of Psychological Distress and stress
- Psychological Distress before and after relocation
- Job Satisfaction and Psychological Distress
- Sources of stress from before to after relocation
- Changes in Personality from before to after relocation
- Stress and Psychological Distress
- Personality and Psychological Distress
- Coping and Distress
- Personality and stress
- Additional relationships with personality and coping
- Academic and non-academic employees

- Differences between female and male employees
- CAM
- Use of Counselling & Therapy
- Exercise
- Limitations
- Recommendations and implications
- Moving forward- Benchmarking and setting targets

4.1.1 Summary of key findings

Table 32 below provides a summary of the key findings. Findings indicate that on-going monitoring and actions aimed at reducing stress and improving Psychological Distress are warranted. This section reviews these findings in relation to the broader literature and the hypotheses predicted.

Table 32. Summary of Key Findings

High Prevalence of Psychological Distress at QMU
There was a high prevalence of Psychological Distress at both time points. A high level of psychological distress was identified with 38% of respondents classified as probable cases at T1 and 42% at T2. Academic staff may be particularly at risk with a higher prevalence of psychological distress than non-academic staff following relocation (59% Vs. 40%).
Psychological Distress remained the same at both time points in matched pairs
Matched participant analysis found no change in the high levels of Psychological Distress from T1 to T2.
Psychological Distress was higher than population norms (25% more cases)
When compared with national and international norms QMU employees had considerably higher levels of Distress. Psychological Distress is higher than the Scottish general population and other occupations. Recent research from the Scottish general population classify between 13-17% of their sample as probable cases (having potential mental problems) compared with 42% of QMU employees.

Stress predicts Psychological Distress

Psychological Distress was significantly and strongly associated (R>.35 in all cases) with high stress at both time points. Employees reporting higher stress have higher levels of Distress. The HSE stressors significantly predicted 41.7% of the variance in Psychological Distress. The HSE stressors explain an additional 31.8% (R square change = 31.8) of the variance in Psychological Distress even when the effects of pre-specified variables (Neuroticism, Coping and age) are statistically controlled for.

Job Satisfaction is associated with stress

Low levels of job satisfaction were correlated with higher levels of Psychological Distress. Following relocation 57% of respondents reported feeling satisfied with their job as a whole, 22% were dissatisfied and 22% unsure. Higher levels of dissatisfaction were reported after relocation.

Sources of Stress

Stress is a significant issue for QMU employees. There is a clear need for improvement across all stressors.
The greatest sources of stress were in the areas of Change, Demands and Managers Support. Suggested targets from before relocation remain unmet with a slightly downward trend across most stressors. Similarly to Time 1, poor performance across several stressors was identified with six out of seven stressors falling below average (compared with results from a representative national survey of employees). Areas requiring urgent action are identified. Several individual questionnaire items were highlighted as requiring urgent action. Notably and as was the case in Time 1, 19 employees reported that they were to some degree 'subject to bullying at work'. 34 reported being to some degree 'subject to personal harassment in the form of unkind words or behaviour'.
Stressors remained largely the same at both time points:
Matched participants analyses showed majority of stress sources remained stable from T1 to T2 with only one significant change in control. That is, participants reported lower levels of control after relocation than before relocation ($p<.05$).

Personality and Coping

Relationships between personality, coping, and stress outcome measures were identified and reported. At both time points the strongest relationships were found between Neuroticism and Psychological Distress and between Emotion focused coping and Psychological Distress. Employees with higher levels of Neuroticism and Emotion focused coping had significantly higher levels of Psychological Distress. Neuroticism was significantly associated with Psychological Distress both before ($Rho=.354$, $p<.01$) and after relocation ($Rho=.599$, $p<.01$). A small but significant relationship was also identified between Psychological distress and Extraversion. A significant increase in Conscientiousness was identified from T1 to T2.

Additional Relationships

Marital status & Age: Married employees reported significantly less peer Support than unmarried employees at T2. Age was significantly related to Psychological Distress at T1 but not at T2. Before relocation younger employees had lower levels of Psychological Distress than older employees. Exercise was correlated with less Psychological Distress and a tendency to report better Relationships at T2 suggesting a potential protective role for exercise. The relationships between personality and exercise were identified at both time points. At T1 higher levels of Extraversion correlated with higher levels of exercise. At T2 Employees with higher levels of Neuroticism and Emotion-focused coping tend to exercise less frequently.

4.2 Prevalence and degree of Psychological Distress and stress in University staff

H_1. *It was predicted that participants would have a significantly higher Psychological Distress when compared with normative data. This hypothesis was accepted.*

Findings were in line with the broader literature in higher education that indicate high levels of stress and Psychological distress in University employees (Biron, Brun & Ivers, 2008; Catano et al., 2010; Daniels & Guppy, 1992; Jacobs et al., 2007; Kinman, 1998; Kinman & Jones, 2004; Kinman & Court, 2010; Tytherleigh et al., 2005; Winefield et al., 2003; Mark & Smith, 2012). Approximately 40% of employees were classified as probable cases indicating considerable Psychological Distress. National and international comparisons revealed higher levels of Psychological Distress for QMU staff. Severe Psychological Distress or caseness was evident with many cases presenting in the upper extremes and well beyond acceptable or threshold levels.

In fact the prevalence and degree of Psychological Distress in QMU appears to be higher than several high risk occupations such as health sector staff, including emergency response ambulance personnel (Mayhew & Chappell, 2003) and is over twice the rate identified in the general Scottish population. Psychological distress measured by the GHQ has been related to severe outcomes including mortality (Puustinen et al., 2011). The primary conclusion in relation to Psychological Distress is that a) there is an urgent need for action to reduce distress and b) an urgent need for on-going monitoring to measure progress or deterioration in this regard. Specific targets for the University could be to reduce employee Distress to below the threshold

score (from 14.7 to 12) and to reduce the cases of distressed employees to national norms (from 42% to 17%).

4.3 Psychological Distress before and after relocation

H_2. *This study predicted that Psychological Distress would be significantly higher following relocation. This hypothesis was rejected.*

High levels of Psychological Distress remained constant at both time points with no significant difference from T1 to T2 in the overall samples or in matched participants. GHQ scores were similarly distributed with similar mean scores (14.2 before vs. 14.7 after) and prevalence of caseness (42% before vs. 38% after relocation). It was anticipated that levels of Psychological Distress may be high in the months leading up to campus relocation but return to lower levels in the months that follow. Organisational change can be a considerable stressor, but following a busy preparation, transition and adjustment period it seemed logical to expect a return to lower or more 'normal' levels . Why this was not the case is unclear and several explanations are possible. Firstly, it is possible that distress was elevated during this period and did not return to normal baseline levels within the follow up time frame. Secondly, this argument presupposes that the level of stress identified before relocation were in fact abnormal for this group. It is possible that high levels of Psychological Distress identified represent a normal baseline for this group and relocation did not impact levels of distress. This is supported by findings of high distress in the literature and also that stress levels across the UK workforce have remained stable (Webster & Buckley, 2008). The stability of distress at the university

might be explained by this stability. As stressors at QMU are associated with Psychological Distress the presumption is that if stress decreases so too will Psychological Distress. Further measurement is required to test whether introducing stress interventions at the university will lead to a reduction in Psychological Distress. Findings from the systematic review (appendix 24) tentatively suggest that this may be possible and highlights interventions in university settings that can lead to improvements in psychosocial outcomes. The detailed findings from this audit provide QMU with a useful platform of knowledge that is rarely seen in the literature (for example, longitudinal data identifying areas of particular need and providing recommended targets for improvement; context specific evidence of protective and risk disposing factors; knowledge of health behaviours).

It is interesting to note that those participating at both time points (i.e. matched participants) had a greater percentage of psychological cases than the sample as a whole (46% vs. 38% respectively). Whether this is a true reflection of a more stressed sub group or due to a smaller sample size is unclear.

4.4 Job Satisfaction and Psychological Distress

H_3. *This study predicted that low levels of job satisfaction would be correlated with higher levels of Psychological Distress. This hypothesis was accepted.*

Staff who reported being less satisfied tended to report more Psychological Distress. There was a significant difference in Psychological Distress between those who reported being satisfied vs. dissatisfied with their job as a whole. This finding is supported by the broader literature. For example, as mentioned in the introduction a

systematic review (Farragher, Cass & Cooper, 2005) of 485 studies (N=267,995) found a strong link between job satisfaction measures and physical and mental Psychological distress. Job satisfaction has been shown to be related to fewer demands, more support, less emotional exhaustion, less depersonalisation, and less anxiety (Dollard, Winefield, Winefield, & De Jonge, 2000).

Given the high levels of Psychological Distress it is not surprising that a large proportion of employees report being dissatisfied or unsure. While half of all employees reported being satisfied with their job as a whole approximately 20% of employees were dissatisfied and the same amount unsure. This reflects low and declining satisfaction rates suggested in the literature (Kinman, 2003).

The single item measure employed in this study provides a potentially practical screening tool for QMU and similar organisations. As would be expected of a good satisfaction measure it correlated strongly at both time points with Psychological Distress. It could easily be implemented in University or department wide surveys.

4.5 Sources of stress from before to after relocation

As mentioned in the introduction, using the HSE management standards has been recommended in recent NICE (2009) guidance to identify risks, and promote well-being and productive and healthy working conditions. The primary functions of the research were to assess the risk, identify future targets for the university, and facilitate action. This research used the HSE management standards indicator tool and identified the risks, demonstrating a need for a reduction across all stressors. Targets to assist in continuous improvement are provided in the benchmarking

recommendation section (4.19.1, p.183) that follows. A potential approach to prioritising action points and specific intervention is by addressing the poorest scoring stressors and additionally by targeting stressors flagged as urgent. Overall, the greatest stressors were identified as Change, Demands and Managers' Support. For each of these stressors, specific items further indicate areas of need and facilitate targeted action. To highlight how this approach might work in practice, the case of the stressors with the strongest relationship to Psychological Distress, those of Relationships and of Peer Support is illustrated in Figure 21.

Figure 21 Evidence based risk assessment and intervention: Using the findings

Risk assessment	Identify the problem		Sample of Potential Actions /steps	Risk Assessment
Extent and sources of stress identified	**Relationships:** Identified as requiring action by HSE Management standards. Strongly correlated with psychological distress (employees with higher relationship stress have higher distress).	19 employees reported that they were to some degree 'subject to bullying at work'. 34 reported being to some degree 'subject to personal harassment in the form of unkind words or behaviour'.	Develop Action Plan Policy: Consult / review / develop policy Create committee for psychological health. Create analysis & recommendation committee concerned with prevention of stress. Consultation with staff (e.g. interviews; focus groups; further questionnaire analysis) Introduce specific intervention (such as awareness / education campaign; manager & employee training; EAP's)	

This highlights a potential process that can be considered rigorous and evidence based. Steps may overlap or duplicate. For example, risk assessment is on-going and action plans can be dynamic in line with an 'action research' approach to intervention. Two points are of note. Firstly, the process follows the WHO risk assessment model described in the introduction. Secondly, it is in line with the best available evidence of

intervention in universities (See Brun, Biron & Ivers, 2008). The model used by Brun, Biron & Ivers (ibid.) serves as a useful example of a potential approach to stress management. It is particularly useful as it employs a risk management approach advocated in the literature, is derived from a solid theoretical background, and provides detailed implementation and process information.

This process can be of use not only in terms of negative response but also, and importantly, for positive responses. For example, it has been suggested that support from peers and colleagues may be an important factor in offsetting other stressors such as low levels of control, and high levels of demand (UCU 2008 report). In QMU there is the potential opportunity to capitalise on the large proportion of staff reporting high levels of peer support (e.g. 75% of staff reported getting the help they need from colleagues; 54% stated that colleagues are there to help when work gets difficult). Capitalising on current strengths and improving access to support for those not currently receiving it may be beneficial. Interventions that enhance support from peers are in line with recent recommendations in the literature (UCU report, 2008). This may be particularly relevant given the finding that married employees report lower levels of peer support than unmarried employees. Assessing why this is the case and potentially targeting this subgroup may be appropriate.

Analysis of matched pairs showed that the majority of stress sources remained stable from T1 to T2 with only one significant change in control. That is, participants reported lower levels of control after relocation than before relocation. This is an important finding, particularly in terms of utility in informing future interventions or training to address stress at the University. As control was the only source of stress to

significantly worsen, specific action to improve levels of control is warranted. In line with the approach outlined in Figure 22 above, general actions (for example, management training, the introduction of policy guidelines relating to control; on-going monitoring) and specific actions targeting the individual control items can be considered and introduced. The strength of the Indicator tool is evident here as it provides 6 items that can be targeted (control in work speed; when to take breaks; choice in deciding how I do my work etc.).

The literature has consistently identified higher levels of control as predictive of better outcomes, and conversely, lower levels of control predictive of poorer outcomes (for example, Fritz et al., 2006; Karasek, 1979; Karasek & Theorell, 1990; Taris et al., 2001). Taris et al. (2001) studied employees from a Dutch university (N = 246) and found that higher levels of strain were related to increased withdrawal from work and that higher levels of control was related to lower levels of strain. Employees with lower reported control detached themselves psychologically from work more so than employees with higher control.

How much control an employee perceives is also likely to influence type of coping strategy employed, with higher levels of control thought to predict increased levels of problem solving and lower levels of control thought to predict increased levels of Avoidance and Emotion focused coping. This has been demonstrated within the chronic illness literature (Compas, Malcarne, & Fodacaro, 1988). Christensen (2000) has referred to his work dealing with contextual features of stressor controllability. He underlines the fact that the contexts of medical treatment will differ in respect to the

degree of control or direction patients have (or may feel they have) over the delivery of treatment.

This is important as the current study found higher levels of Emotion focused coping to relate to more Psychological Distress. This is consistent with the literature on coping that suggests an Emotional style is more likely in situations where change may not be perceived as possible (Compas, Malcarne, & Fodacaro, 1988). If individuals do not perceive change, management, or control as possible they may be less likely to employ Problem focused strategies. Future testing of a potential control-emotion coping-stress model may be beneficial.

What is clear from these findings is that strategies to increase perceived control would be of benefit to QMU employees. These findings are supported by large scale research such as the Whitehall II study and have several policy implications. In choosing actions to increase control among its employees QMU can benefit from considering the established policy implications from the Whitehall study as outlined by Ferrie et al. (2004, p. 7):

- Appropriate involvement in decision making is likely to benefit employees at all levels of the workplace.
- Redesigning practices in offices and other workplaces, to enable employees to have greater control, benefits health.
- Introducing mechanisms for measuring and monitoring employees' level of control over their work provides evidence for making improvements in conditions of work.

This is the first study to use a matched design to assess change in the management standards. Establishing why all stressors except control remained stable requires further research. As with Psychological Distress, further research is required to establish if the high levels of stress identified represent a normal baseline for this group. The HSEs annual omnibus survey has similarly found little change in the management standard stressors between 2004 and 2008 (Webster & Buckley, 2008). However, their findings reflect a general study population (all sectors) and show a lower level of stress than was identified in this study. They also included a single item question assessing high stress (those who indicated their job was extremely or very stressful) and showed a stable response in the education sector, with 28.7% of employees identifying their job as high stress in 2004 and 27.2% in 2008. Despite decreases between these years to 16.1% in 2006 and 19.1% in 2007 no significant trends were identified possibly due to low numbers in the university group and low power to assess change. More research to identify data specific to University employees is required to understand stressors in the sector and to set targets for change.

In the future, organisations relocating can capitalise on the findings presented in this research. The qualitative responses are a useful for these organisations and highlight the practical considerations associated with relocation. Strategies to address the negative aspects that employees associate with relocation (3.1.4, p.137) can be developed in advance. Specifically, managing the following issues is likely to be beneficial:

- Communication, uncertainty, and lack of information.
- Issues relating to transport, travel and new physical environments.

- Negative attitudes and response of colleagues.

Similarly, organisations can capitalise on the reported positive aspects including:

- Social benefits and interaction afforded by new open plan environments
- New beginnings and opportunity for change
- Improved physical environment

4.6 Changes in Personality from T1 to T2

The only significant change in personality from T1 to T2 was observed in the domain of Conscientiousness. A moderate to large effect size demonstrates that participant levels of Conscientiousness were significantly lower following relocation. This was interesting because it was not expected that a stable personality trait would change.

One possible explanation is that a move to an open plan environment necessitated a greater level of Conscientiousness. Open plan environments require a higher level of interaction, sharing and awareness of colleagues. It could be argued that conscientious employees are more suited to, or cope better with, an increasingly social or interactive environment that the new campus environment created (i.e. shared spaces; open-plan). This is a particularly interesting change when considered alongside other noted relationships such as higher Extraversion and higher Agreeableness being associated with higher levels of Psychological Distress at T2 which again would seem logical with the change to a more social environment.

Currently, the dominant paradigm views personality as a stable or enduring characteristic. This study provides evidence that challenges this paradigm and

suggests that personality can change over time. As Segerstrom and colleagues (2012) point out, life span approaches are needed to fully understand how personality (and stress) develop and interact. Several studies lend support to this study's finding of personality change over time and are suggestive of a direction for future research. One 18 year follow up study found increasing levels of Neuroticism over time (Mroczek and Spiro, 2007). Similarly, a meta-analytic study by Roberts, Walton, and Viechtbauer (2006) examined change in 92 longitudinal studies and found Conscientiousness increased in young adulthood (20-40 years of age), Openness increased in adolescence but decreased in old age, and Agreeableness increased in old age. Interestingly, they found that studies in the 1950's and 1960's had higher levels of Agreeableness and Conscientiousness than previous or latter periods and point to the importance of social context to personality development. It is possible as the authors suggest that "*social climate affects the way roles are enacted and the behaviours rewarded in those roles, which then affects personality trait development*" (p. 20). Of particular relevance is the finding from Roberts et al. (2003) that work experiences are related to changes in personality traits. They found young adults decreased in Neuroticism faster if their positions were more satisfying, of higher status, and had greater financial security.

These findings highlight an area for future research and may offer an avenue for potential assessment and targeted intervention in changing organisations. For example it would be possible to identify employees low in certain characteristics (such as Conscientiousness) and provide assistance or training to help prepare them for moving to or entering open plan /new environments.

4.7 Stress and Psychological Distress

H_4. *It was predicted that higher levels of stress would be associated with higher levels of Psychological Distress. This hypothesis was accepted.*

A series of correlations showed that both before and after relocation all sources of stress (Demands, Control, Managers' Support, Peer Support, Relationships, Role and Change) were significantly correlated with Psychological Distress. High levels of stress were strongly associated (R>.35 in all cases) with higher GHQ scores at both time points. That is, participants reporting more stress tended to have higher levels of Psychological Distress. The strongest correlations at both time points were between relationships and Psychological Distress. Lower scores on relationships (i.e. worse scores) were strongly associated with higher Psychological Distress. This is particularly relevant when we consider the individual item findings relating to reported bullying and harassment. Additionally, qualitative responses in section 3.14 showed that staff reported negative attitudes and response of colleagues as one of the biggest sources of stress during the relocation period.

It can be argued that a good measure of stress should be associated with stress related outcomes. At the time of data collection, no studies had assessed the relationship between the HSE tool and stress outcomes. This study found strong associations between all the HSE Management standards (as measured by the HSE indicator tool) and psychological outcome. The HSE stressors significantly predicted 41.7% of the variance in Psychological Distress. Even after controlling for the effects of pre-specified variables (Neuroticism, Coping and age) the HSE stressors explain an

additional 31.8% of the variance in Psychological Distress. These findings suggest the appropriateness of the HSE Management standards approach.

Since this study's implementation, four studies lend support to our findings. One study in the UK prison service (n = 3579) found the HSE indicator tool to be positively associated with Psychological distress (Bevan, Houdmont, & Menear, 2010). Employees with lower scores on the indicator were three times more likely than those with higher scores to have poorer Psychological distress. One study in Italian bank employees found it predicted Psychological distress as indicated by the General Health Questionnaire (Guidi, Bagnara & Fichera, 2012). One study in a telecommunications and financial organisation (n = 103) found that role predicted stress and control and role predicted depression (Gyllensten & Palmer, 2005). Another study found it to be positively associated with job satisfaction and negatively associated with depression and anxiety in health and social services trust employees (Kerr, McHugh, & McCrory, 2009). This lends particular support to our findings in that it also found the most consistent relationship to be between relationship stress and poorer outcomes.

There was a significant relationship between the individual items that the HSE tool identified as urgent and Psychological Distress. Poorer ratings of these items were associated with greater Psychological Distress. The presentation of question-by-question responses highlighted specific stressors and provides an evidence base for future interventions. By far the strongest relationship identified in this study was between Relationship stress and Psychological Distress. This may be particularly relevant given the nature of some of the items in question. It is particularly notable,

regarding Relationship stress, that 29.6% of employees reported that they were sometimes, often or always subject to personal harassment. Some 59.7% of employees reported friction between colleagues, and 16.5% of employees reported being sometimes, often or always bullied. Clearly, these findings present a disturbing picture, illustrating a) a considerable source of stress at QMU and b) unacceptable behaviours in the QMU workplace. Given the potential ramifications of harassment and bullying for both individual and organisation, urgent action is warranted based on these findings. This research strongly suggests that the elimination of bullying and harassment and the improvement of relationships should be considered a priority at QMU. It is suggested that a clear action plan is warranted to address the issue and that this should include a review of policy at QMU.

In choosing actions to improve relationships and develop policy at QMU the established policy implications from the Whitehall study (Ferrie et al. (2004, p. 9) are useful:

- Work environments that facilitate mutual support between colleagues and do not tolerate antisocial behaviour will promote health and Psychological distress.
- Improved levels of support from managers may reduce ill-health and sickness absence.
- Clear and consistent information from managers can have a positive effect on employee Psychological distress and health.

4.8 Personality

Sections 4.8.1 and 4.82 that follow highlight that the most consistent and strongest relationships identified were between Neuroticism and stress and distress. This is in line with the broader literature which shows Neuroticism is the one factor from the big five model that is consistently associated with negative outcomes (Mc Crae, 2006).

4.8.1 Personality and Psychological Distress

H_5. *This study predicted that Personality would be associated with Distress.*

Several predictions with regard to personality and Psychological Distress were proposed prior to the study. In line with the literature the hypothesis that Neuroticism would be associated with higher Psychological Distress was accepted. Participants with higher levels of Neuroticism reported significantly higher levels of Psychological Distress, both before and after relocation.

The hypotheses that the variables of Openness, Conscientiousness, and Agreeableness be associated with lower levels of Psychological Distress were rejected. The hypothesis that higher levels of Extraversion would be associated with higher levels of Psychological distress was rejected at T1 but accepted at T2. A small but significant relationship was identified.

4.8.2 Personality and stress

H_8. *Personality dimensions would be associated with sources of stress in that:* **H_{8a}.** *Higher Neuroticism would be associated with higher levels of stress. This hypothesis was partially supported.*

Previously it was seen that Neuroticism was the primary personality dimension significantly associated with Psychological Distress. It is evident that Neuroticism is also associated with a large number of stress variables at both time points. This is in line with the broader literature (Mc Crae, 2006). Clearly those with higher Neuroticism scores tend to report higher levels of stress, reporting poorer Relationships, less Control and higher levels of Change stress at both time points. It is significantly associated with greater Demands after but not before relocation.

Similarly, Neuroticism is significantly associated with less Peer Support after but not before relocation. As the discussed in the introduction Neurotic individuals may be more reactive to stressors, more likely to appraise situations as threatening, and more likely to choose ineffective coping strategies (Schneider, Rench, Lyons, & Riffle, 2011; Bolger & Schilling, 1991).

H_{8b}. *Higher levels of Openness would be associated with lower levels of stress. This hypothesis was partially supported.*

At T1 higher levels of Openness were associated with less Demands, lower Relationships and Change stress. These represent relatively small associations and none of these relationships were evident at T2.

H_{8c}. *Higher levels of Conscientiousness would be associated with lower levels of stress. This hypothesis was rejected.* Conscientiousness was not associated with any source of stress at T1 or T2.

H_{8d}. *Higher levels of Extraversion would be associated with less stress. This hypothesis partially supported.*

A small but significant association was identified between Extraversion and Role stress at T1 but not a t T2.

H_{8e}. *Higher levels of Agreeableness would be associated with lower levels of stress. This hypothesis was partially supported.*

Those with higher levels of Agreeableness tended to report greater Peer Support at T1 but not at T2. Agreeableness was also associated with Change at T2. That is, participants higher in Agreeableness tended to report less Change related stress.

To the writer's knowledge this is the first time that personality and coping have been looked at in relation to the HSE tool. This examination is important because it shows particular traits that may place employees at risk as well as highlighting traits that may be protective. Both can be the basis of intervention and screening. They highlight sub-groups with increased risk such as academic staff, non-exercisers, employees high in Neuroticism and Emotion focused coping, married employees (low in Peer support). Additionally, they highlight sub-groups high in protective traits such as high Problem focused coping employees, frequent exercisers, and extraverts.

4.8.3 Coping and Distress

H_6. *Higher Emotion focused coping would be significantly related to higher levels of Psychological Distress. This hypothesis was accepted.*

A significant relationship between Emotion focused coping and Psychological distress was found at both time points. A medium sized relationship was identified at T1 and a large or strong relationship identified at T2. That is, participants with higher levels of Emotion focused coping tended to have lower levels of Psychological distress.

H_7. *Higher Problem focused coping would be associated with lower Psychological Distress. This hypothesis was rejected at T1 and accepted at T2.*

At T2 employees reporting a Problem focused coping style had significantly lower levels of Psychological Distress. No significant relationships were identified between Avoidance focused coping and Psychological distress at either time point.

4.8.4 Coping and personality

As regards coping, the results show that Avoidance focused coping was not associated with any personality dimension at either time point.

Problem focused coping was associated with Openness at T1 and T2, with Conscientiousness at T1 and T2, with Agreeableness at T1 and T2, and with Neuroticism at T1 and T2. It was associated with Extraversion at T2 but not at T1. Participants with higher Problem focused coping tend to have lower levels of Neuroticism.

Emotion focused coping was associated with Conscientiousness at T1 and T2, with Extraversion at T1 and T2 and with Neuroticism at T1 and T2. No relationships were identified between Emotion focused coping and Openness or Agreeableness at either time point. Participants with high Emotion focused coping tended to have lower levels of Conscientiousness and Extraversion.

The results show that the strongest correlations between any coping and personality dimension are that of Emotion focused coping and Neuroticism. As Emotion focused coping increases, so too does Neuroticism.

Emotion focused coping was significantly associated with Problem focused coping at T1 and at T2. As would be expected of a good coping measure, as Emotion focused coping increases Problem focused coping decreases. There was no significant correlation between Avoidance coping and Emotion focused coping at T1 or T2 or between Avoidance coping and Problem focused coping at T1 or T2.

4.9 Academic and non-academic employees

H_9. *Academic employees would have higher levels of Psychological Distress than non-academic employees. This hypothesis was rejected.*

Research has identified academic staff as particularly at risk, showing the highest levels of distress coupled with the lowest levels of job satisfaction (Winefield et al., 2002). In line with this it was hypothesised that academic employees would have higher levels of Psychological Distress than non-academic staff. There were no

significant differences in mean GHQ12 scores between the two groups at Time 1 or at Time 2.

However in terms of change from T1 to T2 the results show that the prevalence of Psychological Distress increased approximately twofold among academic staff over the relocation period. There was an increase in the percentage of academics reporting Psychological Distress before (n=27 [40%]) and after (n=25 [59%]) relocation. This is perhaps surprising given that there has been a trend towards improvement in the levels of stress reported by academic staff when compared to non-academic staff across several stressors since relocation. However, when we consider that academic staff report significantly higher levels of demand and that higher levels of demand are associated with Psychological Distress this is not surprising.

Analysis of group differences in satisfaction levels revealed no significant differences at either time point between academic and non-academic staff. However, a small (5.5%) increase in the number of non-academic employees reporting being satisfied was evident. A small decrease in satisfaction (2%) in the number of academic staff reporting satisfaction was found. Following relocation academic staff reported significantly greater demands and significantly greater manager support than non-academic staff.

As regards stress there was a shift between time 1 and time 2 in academic and non-academic reporting of stress. Before relocation Academic staff tended to report greater stress across almost all stressors, and significantly so on Demands, Relationships, Role and Change, only doing slightly better on Control. Following

relocation this is no longer the case, with Academic staff reporting significantly more manager support and greater control than non-academic staff. However they also report significantly greater Demands than non-academic staff.

Clearly, there are differences in the type and degree of stress experienced by academic and non-academic employees, suggesting that tailoring interventions accordingly may be appropriate.

4.10 Differences between female and male employees

H_{10}. *Female employees would have higher levels of Distress than male employees. This was rejected.*

No differences between male or female staff in psychological distress were identified at any time point. While there are a number of studies demonstrating an effect for the role of gender in stress outcomes, several studies have not found any gender effects (Dua, 1994; Jamal, 1999; Leung et al., 2000). The finding that gender is not related to Psychological Distress contributes to the existing literature as regards gender difference in distress in University settings. As noted in the introduction it may be that, while overall strain or distress is similar for male and female employees, the experience of stress may be qualitatively different. Elliott (2008) found that male and female University employees experience similar levels of work and family role strain but that there are important differences in the sources of strain. In line with Elliot's findings this study identified a significant but small difference as regards Role stress, with men reporting greater role stress than women. Addressing role stress among female employees is therefore warranted. Recent evidence suggests that certain

coping assistance may have additional benefit for employees according to gender, and targeted interventions may be appropriate. For example a large Dutch study (Van Emerrick, 2002) found that coping assistance (specifically, a supportive departmental climate and practical assistance in the department) reduced emotional exhaustion in female academic staff.

4.11 Marital status

H_{11}. *This study predicted that married employees would have less Psychological Distress than unmarried employees. This Hypothesis was rejected.*

Those that were married or co-habiting did not differ according to psychological distress at either time point. There is limited evidence in the literature regarding marital status. Leung et al. (2000) found that married professors had higher levels of satisfaction and less psychological distress than single professors. This suggests further research is required to clarify the issue, particularly as the Leung et al. (200) study finding related solely to professors.

This study also found that married employees reported significantly poorer peer support than unmarried employees at T2. Why this was the case is unclear and seems counter intuitive. One possible explanation is that the increased familial commitments of married employees result in fewer opportunities to access colleagues, for example socially, and they perceive less peer support than their unmarried counterparts.

4.12 Age and Psychological Distress

H_{12}. *This study predicted that as age increases Psychological Distress will decrease. This Hypothesis was rejected.*

At T1 the results demonstrated that older employees had higher levels of distress than younger employees at T1 but no relationship was found at T2.

Findings at T1 contrast to findings in the broader literature pertaining to burnout and exhaustion. For example, a recent systematic review by Watts and Robertson (2011) found that younger university employees were more vulnerable to emotional exhaustion. Differences in findings may be due to differences in the underlying constructs being measured (burnout versus distress). That no relationship was found at T2 is in line with Leung et al (2000) who found no relationship between age and stress outcomes including job satisfaction and psychological distress.

Several possible explanations exist for the finding at T1. Firstly, older employees may be in positions of greater responsibility and have greater workload. Secondly, older employees may have greater financial and familial commitments or poorer health. These factors may be particularly relevant at a time of change such as relocation at the campus. This point is supported by the fact that no significant relationship was identified after relocation.

4.13 Additional health related behaviours

This part of the study did not seek to test hypotheses but took advantage of the opportunity to understand additional factors relating to Psychological distress.

Understanding which behaviours or activities employees currently engage (or do not engage) in can be useful and this knowledge offers opportunity to develop initiatives to improve Psychological distress (Goetzel et al., 1996; Anshel et al., 2010; Robertson, 2010). Several notable findings were identified regarding health and coping behaviours.

4.14 Alternative and Complementary Medicine (CAM) [5]

Within the literature, use of CAM is increasingly reported in the general population (Cumming, Simpson, & Brown, 2007; Thomas, Nicholl, & Coleman, 2001). Higher levels of usage are common in unhealthy populations or populations under stress and may provide users with increased feelings of control and self-efficacy. There are debates about efficacy and safety and the term itself refers to a broad range of therapies including homeopathy, herbal medicine, massage, acupuncture, reflexology, and Reiki healing (Fønnebø et al., 2007).

This study assessed CAM usage levels and found that a large number of employees (approximately 30%) reported using some form of alternative /complementary medicine. Analyses revealed no significant relationships with Psychological Distress, stress or job satisfaction at either T1 or T2. Further research is clearly necessary before any judgment is made on the benefit or lack of benefit of these therapies. It could be that users perceive CAM therapies as useful for a variety of reasons (for

[5] ''Complementary and alternative medicine is a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine." (National Institute of Health, 2009)

example, in managing stress or stress related outcomes; in increasing perceived control or perception of support coming from therapy providers etc.). While beyond the scope of the present research, further investigation is advised. There is a clear argument for the benefits of certain therapies and it is evident that these therapies are accepted among many QMU employees. As such they may represent a useful intervention/resource for employees in managing stress and improving Psychological distress. However, caution is required in making recommendations at this stage. Complementary and Alternative Medicine is distinct from conventional approaches and is often criticised by the scientific model for lacking robust evidence. In fact, recent UK reviews highlight the lack of evidence supporting CAM (Power & Hopayian, 2011).

4.15 Use of Counselling & Therapy

The majority of participants do not attend counselling. This is interesting in light of the high levels of Psychological Distress identified in this study and the relationship between these levels and stress. The use of counselling may represent a beneficial resource for improving Psychological distress in this group in the future. Evaluating awareness of currently available support services and their uptake, as well as investigating the benefit of new support services and related information provision /campaigns, may be appropriate.

4.16 Exercise

Findings show that while most participants report some form of exercise, the frequency of this exercise is low with only 25% of participants meeting the guideline of 'five a week' recommended by the Department of Health (2004). One in ten QMU employees take no physical exercise and 47% exercise only once or twice per week. The results also showed that employees who exercised more had lower levels of Psychological Distress and reported less relationship stress. While any causal inference is to be avoided the benefits of exercise to physical and mental health and illness are well established. Developing initiatives to improve the low levels of exercise evident in QMU employees may be of benefit to employee health and Psychological distress. Worksite stress interventions have incorporated exercise related programs in universities with some success (Robertson, 2010; Peterson and Dunnagan, 1998; Evans et al., 1989; Goetzel et al., 1996).

Ensuring access and availability of a variety of exercise options may represent a useful intervention for this group. Participation in regular exercise and in fitness programs has been associated with greater job satisfaction and reduced absenteeism (Haines et al., 2007; Peterson & Dunnagan, 1998). While facilities, access, and availability are important, looking at ways to encourage greater frequency and maintenance of uptake is equally important.

Why some employees exercise and others do not is of interest to universities seeking to introduce strategies to manage or mitigate stress, and improve the health of employees. Providing exercise options is a good start but considering how to

encourage non-exercises to adopt exercise is equally if not more important. Several theories from Health Psychology have shown promise in predicting exercise behaviour. This is even more important in stressed groups such as university employees, as stress may decrease exercise (Heslop et al., 2001).

Universities could take note that belief and confidence in one's ability to carry out exercises [e.g. from the Health Belief model (Sonstroem, 1988), and self-efficacy models (Bandura, 1995)] has been shown to predict exercise (Rodgers et al., 2002). Similarly, studies have found that the decision to start exercising can be attributed to belief about the pros and cons, and the belief that there were more benefits in taking up exercise (e.g. drawing from the Health Belief Model; Marcus et al., 1992), such as perceived social and health benefits (Riddle, 1990). Highlighting and encouraging employees to focus on the pros is therefore thought to facilitate employees to move from thinking about exercising to actually implementing the behaviour. People who exercised frequently in the past are also more likely to exercise in the future and studies have validated the theory of planned behaviour in this regard (Norman & Smith, 1995). In line with these theories, understanding the barriers to exercise (Hausenblas et al., 2001) is also necessary. What is clear is that there are many factors in the decision to exercise. If universities choose to promote health interventions amongst employees, considering contributions from Health Psychology models is advised.

Incorporating exercise initiatives into broader interventions may be particularly beneficial (Robertson, 2010; Peterson and Dunnagan, 1998; Evans et al., 1989; Goetzel et al., 1996). For example, a study by Robertson (2010) at the University of

Aberdeen reported a reduction in stress/anxiety related absences from 10.4% in 2009 to 8.4% in 2010 (average days lost per person due to stress/ anxiety reduced from 0.69 to 0.50) as well as a 2.9 percentage point improvement across their stress assessment questions. They report a stress training programme and physical exercise initiatives (free gym membership for all staff; trial of 'fitbugs'- a pedometer with motivational feedback via personalised webpage for 150 staff). Similarly, one multi-element Psychological distress program at Montana State University (Peterson & Dunnagan, 1998) reported a significant difference in job satisfaction only for those who exercised regularly for the past six months, compared with those who did not.

This research examined frequency of exercise in employees but future research may also benefit from measuring duration as well as frequency of activity. An interesting finding in the current study was that employees who exercise more had higher levels of Extraversion. This is particularly interesting when considered alongside the finding that those with higher levels of Extraversion have higher levels of Psychological distress. It is possible that exercise moderates the relationship between Extraversion and Psychological distress. Further research is required to test potential pathways by which Extraversion might influence Psychological distress. As a direction for future research, that exercise may moderate Psychological distress makes intuitive sense. That people who exercise have higher levels of Extraversion (or vice-versa) is perhaps not surprising as exercise may both require and provide social interaction, making it particularly suitable and rewarding for extraverts.

If an Extraversion-exercise-Psychological distress relationship is found to be consistent, future explorations of this potential pathway might be particularly fruitful.

For example, a brief measure of Extraversion may represent a useful screening tool to identify those more likely to exercise and consequently have higher levels of Psychological distress. Similarly, it could identify those less likely to exercise and who consequently have lower levels of Psychological distress. In both cases it might present a useful avenue for using personality information to tailor interventions towards employees. For example, offering extravert-specific (possibly group programs) or introvert-specific (possibly individually structured) exercise options. Additionally, further evidence for the role of personality and coping pathways were found, with employees who exercised less having higher levels of Neuroticism and Emotion focused coping. This research supports Segerstrom & O'Connor's (2012) call for further investigation of the pathways underlying the Personality-Stress relationship and identifies a potential avenue of investigation.

One additional finding was the change in job status reported. At T2 there were 5% fewer full-time staff and 5% more part-time than at T1. With a large proportion of Higher Education employees on non-permanent contracts and an indicated growth in short term contracts in the UK future research would benefit from examining additional variable such as job insecurity (Court & Kinman, 2008; Tytherleigh, Webb, Cooper & Ricketts, 2005; Centre for Higher Education research and Information, 2007).

This research described sources of stress, psychological distress, job satisfaction, personality, and coping at QMU and identified relationships between these factors. QMU fell below the average in 6 out of 7 stressors when compared to a national representative sample. High levels of distress are evident, and with more than double

the national prevalence, on-going monitoring and action to reduce distress are required. Stressors predict distress even when Neuroticism and Emotion focused coping are accounted for. Stressors were also shown to be stable except in the case of control stress which increased significantly from T1 to T2.

These findings provide QMU with important risk assessment data that can be used for on-going monitoring and that highlight areas that may benefit from intervention. Potentially protective factors (such as exercise, levels of Extraversion) and risk disposing factors (such as marital status, Neuroticism, Emotion focused coping) were identified. The research is novel in its multivariable and longitudinal approach and in its use of the HSE Indicator tool, and outlines several potentially important avenues for further research. These include the investigation of the role health behaviour - personality – coping pathways to stress outcome, and of the ability of personality to change over time and in response to environment.

Prior to presenting specific targets and recommendations in section 4.18, limitations of the research are discussed.

4.17 Limitations

There are clearly potential limitations associated with this research and these are discussed below.

One potential limitation concerns response rates and potential response bias. Regarding these, when considering the response or participation in this study it is important to be aware both of participants and non-participants. Several response

biases are possible in this regard. Firstly, as a form of self-selection, it is possible that those who were more stressed were more likely to participate in our study, thus biasing results in favour of this more stressed group. It is arguable that stressed individuals would be more likely to wish to elaborate their plight, or indeed to provide information that might be helpful to other staff in some way. This would tend to produce results describing a subset of highly stressed and psychologically distressed people, and not necessarily being representative of the entire QMU population.

Conversely, it is also possible that those who were less stressed were more likely to participate in our study, as lower stress levels might allow more reflection time, interest in research, and general amenability. In effect this would mean that the findings are 'best case scenario' in terms of stress and Psychological Distress.

In practice, while the researcher must be aware of these confounding possibilities, particularly when extrapolating findings or building an intervention based on sample feedback, in practice it must be accepted that uncertainty is always present in this type of study, and one with apparently low response rates. Questionnaire confidentiality does not allow for contact with non-responders, questioning why they did not respond.

While these are relevant concerns, it is suggested that these biases are unlikely for several reasons. Firstly, it was decided to survey the entire QMU population rather than sub-sampling, in the hope of accessing as many employees as possible. This enabled study of a good proportion of these employees and gave each employee the same chance to participate.

Future interventions to address stress may benefit from addressing this potential response bias. A large barrier to the effectiveness of evidence-based interventions is that most are not designed to reach at-risk populations (Glasgow et al., 2003). They were designed for, and their efficacy evaluated, on self-selected samples. Prochaska et al. (2007) highlight the limitations associated with this approach (i.e. primarily accessing motivated rather than unmotivated individuals). Future research could benefit from assessing the motivations for participation in interventions. Identifying the reason why employees self-select to interventions will enable a) the ability to target and meet the needs of these employees more appropriately and b) may shed light on the employees that withdraw from interventions. While beyond the scope of this discussion, one study within a University population was identified, which specifically assessed participant's motivations for engaging with the intervention (Tamim et al., 2009) that provide a useful starting point for future research design.

At face value, the sample size demonstrates a low response rate, which fell following relocation. However, a 20-30% response rate is not surprising, given high levels of change, increased demands of relocation and high levels of staff turnover throughout the relocation period. Approximately 15% of staff left QMU during this time. Moving over 16 miles to a new campus and adapting to significant environment change (e.g. location, transport times, technological advancements, open plan environment, social, familial) place additional and not insignificant pressures on employees (the findings lend support to this position here) that are likely to reduce response rates.

The response rates obtained, however, were directly in line with the broader literature from similar University research studies, suggesting that this is not an unexpected rate of response for this population. For example, Winefield et al.'s (2002) national study across 17 Australian Universities (N=8732) yielded a 25 % response rate; Catano et al.'s (2010) study of 1440 staff across 56 Canadian universities yielded a response rate of 27%; Kinman & Court's (2010) study of 9740 UK Higher education employees achieved response rate of 24%, and Kinman & Jones 2004 study of 5000 employees achieved a response of 22%.

The question of whether the sample reflects the population is relevant to any discussion of limitations. Despite this small sample, several population/sample comparisons are indicative that it may be a representative sample. Population v. sample fulltime respondents are 74/77%, parttime are 26/23 %; Male v. female are 35/26% and 65/73%. The proportion of academic to non-academic population/sample is 46/54 and 54/46. How to interpret this is not clear.

Because of small sample size, group differences that were not significant in this study may require larger sample sizes to reach significance (for example, there was a comparatively small proportion of male participants.).

Caution must be used in any attempt to generalise the specific findings of this study into other university settings. Firstly, these findings may be culturally specific (i.e. reflecting a primarily Caucasian university sample in Scotland). Secondly, while this study's findings are in line with the broader literature it is important to remember that

they are indicative of a population during a time of change and they are an appropriate indicator primarily for the university population under study.

Another potential limitation was that in many cases the non- parametric distribution of the data limited the range of statistical testing that could be undertaken. It is possible that more powerful parametric techniques would have identified more significant relationships.

It is also recognised that factors external to work were not measured in this study (such as caregiving responsibilities, family conflict, challenging child behaviour) and may impact an employees reported stress levels (Catano et al., 2010; Fredrickson et al., 1997; Martin & Saunders, 2003).

A note should also be made to the delay period between T1 and T2. While this was a pre/post design, the interval increased to about 10 months due to extraneous factors. To some extent, the fall off in sample size from T1 to T2 could represent any or some of loss of interest, improvement in stress levels, ending employment or increased workload.

4.18 Implications

It is clear that much of our data supports current models of occupational stress including demand-control models (Karasek, 1979); role and relationship models (French, 1973); decision latitude & effort-reward imbalance models (Siegrist & Peter, 1994); and change and support models (House, 1981). These factors measured by the unifying framework of the HSE Indicator tool strongly predicted distress across time, and while controlling for individual factors.

However, not all the data supports, or at least has implications for, current models of occupational stress. The finding that individual stressors had weak predictive ability, but as a set strongly predicted psychological distress is important. These findings suggest that narrow models that focus on one or two stress variables may neglect important cumulative or interactive impacts of stressors, and/or have limited predictive ability. These findings lend support to the argument that simplistic approaches are likely to be inappropriate and that there is a need to adopt more diverse and complex approaches to measuring such a complex experience (Segerstrom & O'Connor, 2012; Carver-Connor Smith, 2010).

Specific support models of occupational stress should consider revision to account for our finding that being married has negative implications for levels of social support (i.e. reduced peer support). Additionally, occupational change models could also consider incorporating the finding that new environments (such as open plan) may lead to reduced control and increased conscientiousness among employees. Further

the findings that exercise has multiple relationships with personality, coping and can lead to poorer outcomes requires, further consideration.

Additionally, there is some evidence to suggest that the course of workplace changes may need more consideration. For example, Griffin (1991) found that results of job interventions changed at 6, 24, and 48 months. Research that accommodates longer follow up periods might therefore be beneficial. Six or eight months may not be long enough to establish positive (or negative) effects.

This thesis presents evidence that challenges a key theory within Health Psychology, that personality is a stable characteristic. The matched participant findings showed that certain personality characteristics (Conscientiousness) can change within a relatively short period of time. This finding, in addition to other studies we identified that support this idea, has implications for practice. Firstly, it is suggested that research should now explore changes in personality across the lifespan. Secondly, it is recommended that longitudinal studies now require more than an initial baseline personality assessment. Finally, that personality changes opens up a considerable avenue for screening and intervention. This may be of great importance given the extensive volume of evidence that personality predicts a plethora of positive and negative health and wellbeing outcomes. The question must be asked, can (and should we) change personality to improve health outcomes?

A key goal of Health Psychology is to understand why people engage (or do not engage) with health behaviours in a range of settings (Ogden, 2004). There currently exists a gap for health psychologists to explore many of the directions for future

research identified in this thesis (for example, potential exercise-personality-coping-distress pathways discussed in section 4.16). The literature shows a link between chronic stress and illness, for example in causing Atherosclerosis, and also that exercise protects against such illness (Kivimaki et al., 2002). Our findings suggest that individuals with certain personality and coping characteristics (e.g. Neuroticsim, Emotion focused coping) are less likely to exercise and more likely to have higher stress. While not conclusive, this may suggest that targeting interventions towards personality or coping typologies could be particularly beneficial. This is worthy of further research as the potential applications of such approaches could be far reaching, for example, in exercise interventions common with patients recovering from illness, or chronic pain.

Another implication from the finding that university employees are highly distressed is that that examining the physical health of this group is likely to be important (given the evidence for a stress-illness link). It could be expected based on sustained findings in this regard that this group may have more illness.

One of the limitations of current (and this) research is its simplicity. Stress is complex and involves multiple contributing factors. We know that stress can lead to illness directly by its physiological impact or indirectly through health behaviours. Future research could consider more of the behavioural factors that are relevant to the stress-illness link. For example, a large Scottish study by Heslop et al. (2001) found that higher perceived stress was associated with more smoking. Similar patterns have been identified in terms of increased alcohol consumption (Metcalfe et al., 2003) and food consumption (Aiken, 1981). Tension reduction theory (Cappell & Greeley, 1987)

suggests that individuals engage in these behaviours as a means of reducing tension associated with stress.

Additionally, Health Psychology is well placed to address the lack of well-designed interventions in this group. In particular it can develop primary prevention interventions that target stress at the source rather than simply responding to it. It is also well equipped to design and implement interventions to promote or improve health and well-being in employees. As discussed in the introduction, theories of health behaviour change and motivation may be helpful here.

Using frameworks of key health psychology theory may help explain why employees engage in certain supportive behaviours. A relevant (and rare) example comes from a relocation study that tested the theory of planned behaviour (Ajzen, 1991). They found that intention to engage in change supportive behaviours were predicted by perceived advantages and perceived colleague support of the relocation. Understanding intention to engage in workplace interventions can be viewed as critical to the success of any such interventions. However, little information exists as to motivation to engage in the university context.

4.19 Recommendations

4.19.1 Moving forward - Benchmarking and setting targets

A primary goal of the research was to identify sources of stress with a view to informing future targets and assisting in on-going monitoring and evaluation. This can be seen as the cornerstone of effective risk assessment approaches (Biron, 2006; WHO, 2003). The sources of stress measure employed in this study facilitated this, outlining aspirational targets for the interim and long term. Figure 22 graphically displays interim and longer term targets for QMU.

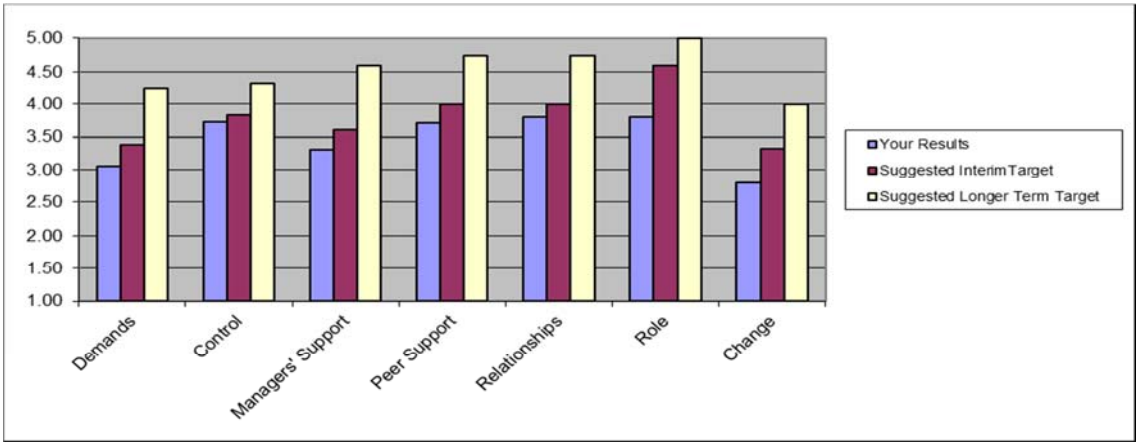


Figure 22. Graphic display of suggested stress targets

It is noteworthy that the interim targets which were identified before relocation (see Appendices 23, p. 254 and Appendix 26, p. 269) have not been met. In fact, a slightly downward trend across all stressors is evident. Across all stressors a clear need for improvement was identified. Poor performance across several stressors was highlighted with six out of seven stressors falling below the average. These are 'yellow lighted' in Table 33 below. Role issues were identified as requiring urgent action, representing those below the 20th percentile.

Table 33. Suggested stress targets

	QMU Results	Suggested Interim Target	Longer Term Target
Demands	3.06	3.38	4.25
Control	3.73	3.83	4.33
Managers' Support	3.31	3.60	4.60
Peer Support	3.71	4.00	4.75
Relationships	3.80	4.00	4.75
Role	3.80	4.60	5.00
Change	2.80	3.33	4.00

Key	
	Doing very well - need to maintain performance *Represents those at, above or close to the 80th percentile†*
	Good, but need for improvement *Represents those* better *than average but not yet at, above or close to the 80th percentile†*
	Clear need for improvement *Represents those likely to be below average but not below the 20th percentile†*
	Urgent action needed *Represents those below the 20th percentile†*

† Compared with results from a representative national survey of employees (HSE Analysis Tool User Manual, 2004)

Several individual questionnaire items were highlighted as requiring urgent action or 'red flagged' (see Appendix 23 and 26). Perhaps most notably and as was the case at Time 1, question 21 ('I am subject to bullying at work') was flagged as requiring urgent action, with 19 staff reporting being 'always' (n=1)'often' (n=2) or 'sometimes' (n=16) bullied at work. Similarly, in response to the question 'I am subject to personal harassment in the form of unkind words or behaviour', 24 respondents revealed 'sometimes', 8 respondents revealed 'often', and 2 respondents stated 'always'. Specific items that were flagged as urgent were as follows:

- I am clear what is expected of me at work
- Different groups at work demand things from me that are hard to combine
- I am clear what my duties and responsibilities are
- I am clear about the goals and objectives for my department
- I understand how my work fits into the overall aim of the organisation
- I am subject to bullying at work

- I get help and support I need from colleagues
- I receive the respect at work I deserve from my colleagues

The HSE targets provide a useful reference point for institutions to aim towards. They are aspirational benchmarks based on the top performing organisations (top 20% of the distribution). While these are admirable goals it appears that they are far from being met in reality (Psychosocial Working Conditions in Britain, 2008; University and College Union, 2008). In fact Table 34 below shows that QMU is performing better than recent HEI averages (University and College Union, 2008).

Table 34. QMU stress compared with HEI average

	2008 HEI Average	QMU After Relocation
Change	2.47	2.79
Demands	2.59	3.06
Managers Support	2.91	3.31
Peer Support	3.39	3.7
Control	3.7	3.72
Relationships	3.5	3.79
Role	3.67	3.8

Lower score indicates greater source of stress

5 CONCLUSIONS

A key goal of the HSE Management standards approach is "to reduce the levels of work-related stress experienced by working people in Britain" (Cox, Karanika-Murray, Griffiths, Wong, & Hardy, 2009, p. 1). Establishing why there have been few improvements in levels of workplace stress in the UK since the introduction of the standards is necessary. Identifying the problem is of limited use if it does not lead to tangible changes.

The arguments for the HSE population based approach are clear and the HSE stress measure is a useful starting point for employers. The findings regarding the ability of the HSE management standards measure to predict Psychological Distress lend support to the appropriateness of this measure. If there were no associations with outcome, stress interventions would be unlikely to result in improvements therein (Macleod & Davey Smith, 2003).

Findings from this study show that individual factors such as coping and personality are related to employee stress and Psychological Distress. Using these findings to develop interventions may represent a useful avenue for reducing the stability of workplace stress that is evident at QMU and in the broader workforce. The strongest and most consistent evidence provided in this study across two time points is that employees with high levels of Neuroticism and Emotion focused coping are particularly at risk for Psychological problems. Individuals with high Neuroticism are highly distressed and have several related disadvantages. Specifically, this study showed that they tend to choose ineffective coping strategies and have higher levels

of stress, reporting poorer Relationships, less Control and higher levels of Change stress at both time points. Additionally, these employees exercise less, a factor also associated with low levels of Psychological distress in this study.

The systematic review (Connolly, 2013) demonstrated that there is limited evidence as to which interventions might improve outcome. The findings in this study are therefore particularly relevant. They provide strong evidence for the development of interventions designed to change choice of coping strategy from emotion to Problem focused coping. Similarly they provide evidence to suggest initiatives to increase factors associated with Psychological distress such as exercise might be beneficial.

Findings were provided to the University through a series of meetings and report presentations. Additionally, they were disseminated online and presented and abstracted in conference proceedings (Connolly, 2009). Subsequently, well-being initiatives have been developed at QMU, to include a well-being representative group and well-being initiative. Human resources sponsor initiatives such as an eight week course on mindfulness and body awareness course, open to staff and students.

Consideration and further evaluation of initiatives aimed at increasing exercise frequency, on capitalising on high levels of peer support, and at increasing perceived control amongst employees is warranted. Additionally, sub-targeting of academic vs. non-academic groups (to decrease levels of Psychological Distress), married employees (to increase Peer Support), and male employees (to reduce Role Stress) are appropriate as differences were identified in stress reporting of these groups.

The literature review also demonstrated that most interventions to manage stress in universities are aimed at the individual. This is problematic, and is not reflective of best practice. Placing responsibility solely with the employee is inappropriate. Best practice is to address and manage stress in a preventative rather than reactive way, to address the cause not the consequence.

This research strongly suggests that the elimination of bullying and harassment and the improvement of relationships should be considered a priority at QMU. It is suggested that a clear action plan is warranted to address the issue and that this should include a review of policy at QMU.

Action to increase control at QMU is warranted. This includes ensuring appropriate involvement in decision making. Redesigning practices to enable employees to have greater control is likely to benefit employee health and reduce distress.

This thesis presents findings of the first longitudinal study investigating psychological distress, stress and individual factors in University employees. They provide an evidence base that shows the development and implementation of initiatives to improve staff health in the University are warranted. They provide directives for further and on-going research, and also provide specific recommendations to be considered for implementing focused interventions. The study also involved the development of a new, short-form version of the CISS and provides a valuable new assessment tool for subsequent use.

Findings support and facilitate several important action points, including:

- *On-going Evaluation and Monitoring.* The existing research and related database afford the opportunity to a) monitor and track stress and Psychological distress on an on-going basis and b) assess whether interventions to reduce stress and increase Psychological distress are working.
- *Actions and initiatives to reduce stress and improve Psychological distress:* The data provide an evidence-base for recommendations regarding individual and organisational initiatives to address specific sources of stress and increase psychological distress. Interventions can be tailored to improve poor performance on specific stressors or their sub-components. Similarly, strengths identified in the HSE tool can be used to facilitate interventions.

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7 APPENDICES

Appendix 1: Systematic review protocol: Occupational stress interventions in third level universities: a systematic review

NOTE:
This is a summary of the methodology.
The full protocol document is available on request.

Methods

Criteria for considering studies for this review:

Types of studies

Evaluative studies were included in the review (minimum ***rating according to Murphy's (1996) evaluation of the quality of stress research criteria). Alternative studies informed the review but did not contribute to the final analysis.

Types of participants

This review included studies of third level Universities and their employees.

Types of intervention

Stress management interventions to reduce stress in University employees.

Exclusion criteria

- Interventions in non-university employee populations; Interventions without evaluation /outcome assessment;
- Interventions with non-self-report outcome measures;
- This review is primarily concerned with psychosocial outcomes;
- Studies conducted in hospital settings.

Types of outcome measures

A variety of outcome measures have been used to address occupational stress. This review was primarily interested in studies using self-reported measures of psychosocial outcomes to include but not limited to: Specific stress and sources of stress measures; Work/life balance; Burnout; Depression; Anxiety; Psychological Distress; Quality of life; Coping; Satisfaction.

Search strategy for identifying studies

Review of related studies as well as MESH terms identified potentially relevant key words (e.g. Watts & Roberston, 2011; Beacons of excellence report, 2003; La Montagne et al., 2007; Marine et al., 2009). Two reviewers independently carried out the searches and selected the studies to include in the review according to the inclusion/exclusion criteria. If there was any disagreement concerning the inclusion of a study, this was discussed jointly, and where necessary a third reviewer resolved the disagreement. The researcher endeavoured to contact the principal investigators of the identified studies, as well as experts in the area to identify other relevant studies.

The search terms entered were as follows:

("stress" OR “distress” OR “strain” OR “burnout” OR “pressure” OR “wellbeing” OR “psychological distress”) AND (“university” OR “college” OR “third level”) AND (“employee” OR “staff” OR “faculty” OR “lecturers” OR “academic staff”).

The following electronic databases were searched:

1 The Cochrane Library
2 The following databases were searched via EBSCOHOST: Cumulative Index to Nursing and Allied Health (CINAHL), PSYCHINFO, Medline
3 Educational Resources Information Centre (ERIC, via Proquest)
4 PubMed
5 SCOPUS
6 System for Information on Grey Literature in Europe (SIGLE/OpenGrey)
7 National Center for Alternative and Complementary Medicine (NCAM)
8 Design rating and methods appraisal

This review aims to identify relevant studies of stress intervention in Universities. Agreement as to what constitutes an intervention is not always straightforward (Hodges et al., 2010) but the word, from its Latin origin, refers to what comes between. Intervention was defined as the planned introduction of a variable aimed at influencing change in the predefined outcome measure.

Design rating

For the purposes of this review and in line with previous research (Murphy, 1996; Beacons of Excellence Report, 2003) a basic system was specified requiring evaluation as a minimum standard. The design rating system (Table 35) employed by Jordon et al (2003) in their ‘Beacons of excellence’ report (adapted from Murphy, 1996) was used. This system was employed only to facilitate the identification and

review of evaluative studies and does not represent any judgement on study quality by the author.

Table 35. Research Design ratings [a]

*	**Research that is descriptive, anecdotal or authoritative.**
**	Research without intervention, with results that may be used in future studies.
[b]***	Research not involving a control group or randomisation but with an evaluation.
****	Research involving a systematic study with control groups but without randomisation.
*****	Research involving a systematic study with a randomised control group.

[a]*From Jordan et al. (2003)* [b]*Cut off point for this review*

Methods appraisal

Additionally, method appraisal criteria, adapted from the literature, and existing systematic reviews of complex interventions by Egan et al., (2007) (Table 2) were used. The heterogeneity of interventions, differing designs, comparison groups and outcome measurement made meta-analysis and effect size comparisons inappropriate. Therefore narrative synthesis was deemed most appropriate. In line with similar systematic reviews, data were categorised and tabulated by methodology, intervention type, and outcome and employed a narrative that emphasised more methodologically robust studies (e.g. Egan et al., 2007). To facilitate future research and intervention in the area, and as a reflection of intervention adoption, information is provided relating to the implementation / process where available (re user acceptance; intervention adoption; funding & resources; attrition).

Appendix 2: Introduction Letter

Queen Margaret University
EDINBURGH

Dear Queen Margaret Employee,

I am requesting your help in looking at how campus relocation affects stress and psychological distress. Relocating to a new campus creates new challenges for almost everyone and has the potential to affect stress and psychological distress. This study hopes to give you the opportunity to provide information relating to particular sources of stress for you. This information can then be used to attempt to inform and change these sources of stress and inform the best ways in which they can be managed.

I am a doctoral student in Health Psychology here at Queen Margaret University College in Edinburgh. I have a special interest in stress and how people and organisations manage stress and its effect on psychological distress.

The study will hopefully extend our knowledge of the sources of stress for employees at the university and the effects of coping strategies and personality in dealing with stress. The aim of the research is to determine the primary sources of stress during relocation and to identify strategies which people find most useful in coping with stress.

The study looks at three areas –sources of stress, coping with stress, and individual characteristics. These factors are investigated using three short questionnaires which should take no longer than 15-20 minutes to complete.

When you read this you may wish to participate. You are asked to complete the questionnaires and return them in internal mail in the pre-addressed envelope provided**.** At this point I would like to assure you that **the utmost care has been taken to ensure that complete confidentiality will be maintained at all times.** All data will be anonymised as much as possible. Your name will be replaced with a participant number, and it will not be possible for you to be identified in any reporting of the data gathered. You will be given the same questionnaire to complete after relocation for comparison purposes.

If you require any additional information, please contact me and I will be happy to respond. In this case it is not necessary to identify yourself or give any personal information. Alternatively, if you would like to contact an independent University lecturer, who knows about this project but is not involved in it, you are welcome to contact Vivienne Chisholm. Contact details are given below.

I would like to take this opportunity to thank you for taking the time to read this. I know there are many research demands placed on you. However I hope that, with your help, my research will help to identify particular sources of stress at the University and ultimately lead to the development of resources to best manage and cope with these sources of stress.

With Kind Regards,

John Francis Connolly

Contact details of the researcher

Name of researcher:	John Francis Connolly, B.A., M.Sc.
Address:	Doctoral Student in Health Psychology, School of Social Sciences, Media and Communication, Queen Margaret University College, Clerwood Terrace, Edinburgh, EH12 8TS
Email:	qmurelocation@gmail.com

Contact details of the independent adviser

Name of adviser:	Vivienne Chisholm
Address:	School of Social Sciences, Media and Communication Queen Margaret University College Clerwood Terrace, Edinburgh, EH12 8TS
Email / Telephone:	vchisholm@qmuc.ac.uk/ 0044 131 317 3613

Appendix 3: Consent Form

Queen Margaret University
EDINBURGH

Consent Form

"An evaluation of stress and psychological distress in university employees during campus relocation"

_____ I have read and understood the information sheet and this consent form. I have had an opportunity to contact the researcher and an independent supervisor to ask questions about my participation.

I understand that I am under no obligation to take part in this study.

I understand that I have the right to withdraw from this study at any stage without giving any reason.

I agree to participate in this study.

Signature of participant: _____

(Initials will suffice)

Signature of researcher: _____ Date: _____

Contact details of the researcher

Name of researcher:	John Connolly
Address:	Postgraduate Student, Professional Doctorate in Health Psychology, School Of Social Sciences, Media and Communication Queen Margaret University College Clerwood Terrace, Edinburgh, EH12 8TS
Email:	qmurelocation@gmail.com

Appendix 4: General Background Information

(please tick box or write in answer)

This section allows comparison between different groups in the study. It would be helpful to have all items answered but if you would rather not answer a question please leave it blank and complete the others. Thank you.

1 **Age in years**

_____

2 **Sex**

☐ Female ☐ Male

3 **Country of birth**

_____

4 **Marital status**

☐ Married ☐ Single ☐ Widowed

☐ Separated ☐ Divorced ☐ Remarried

5 **Years of Education** - Please circle the *highest* year of school completed:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23+

(Primary) (Secondary) (College/university) (Graduate School)

6 **Job Title**

_____

7 **Working**

☐ Part-Time ☐ Full-Time

8 **Do you use any of the following**

☐ Reflexology ☐ Homeopathy ☐ Massage ☐ Acupuncture

☐ Other _____

9 **How often?**

_____

_____

10 **Do you take any physical exercise?**

☐ Yes ☐ No

11 **If yes, what type of exercise**

_____

_____

12 **How often do you exercise?**

_____

_____

13 **Do you attend counselling/therapy?**

☐ Yes ☐ No

14 **How do you feel about your job as a whole?**

☐ Satisfied ☐ Dissatisfied ☐ Unsure

15 **What are 3 positive things you associate with the move?**

_____

_____

_____

16 **What are 3 negative things you associate with the move?**

_____

_____

_____

17 **What are the biggest cause(s) of stress for you associated with the move?**

_____

_____

_____

18 **What would be helpful to you in managing this stress?** (e.g. relaxation resources, activities, classes, forums, physical exercise)

_____

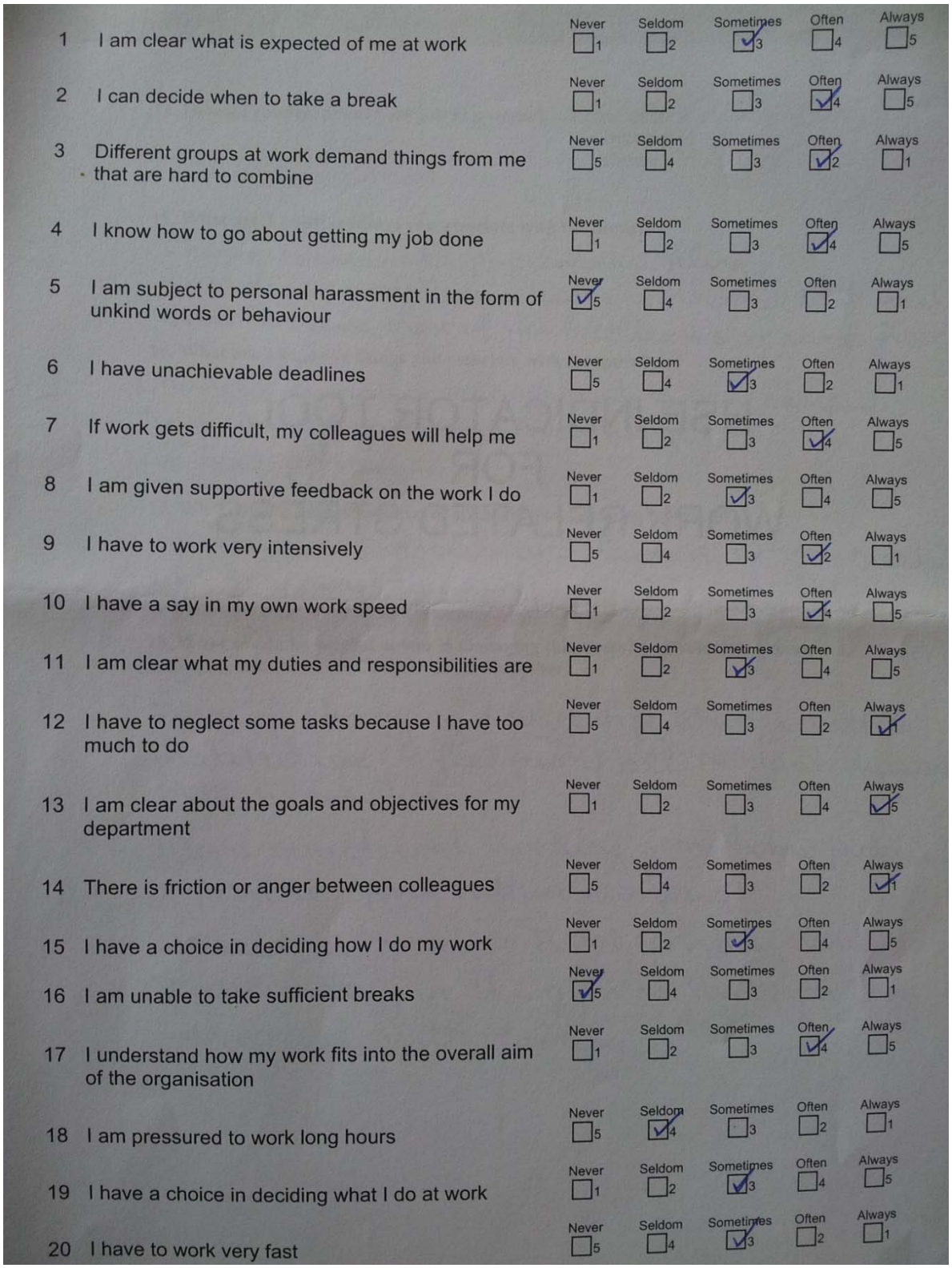
_____

_____

Appendix 5: HSE Stress Indicator Tool

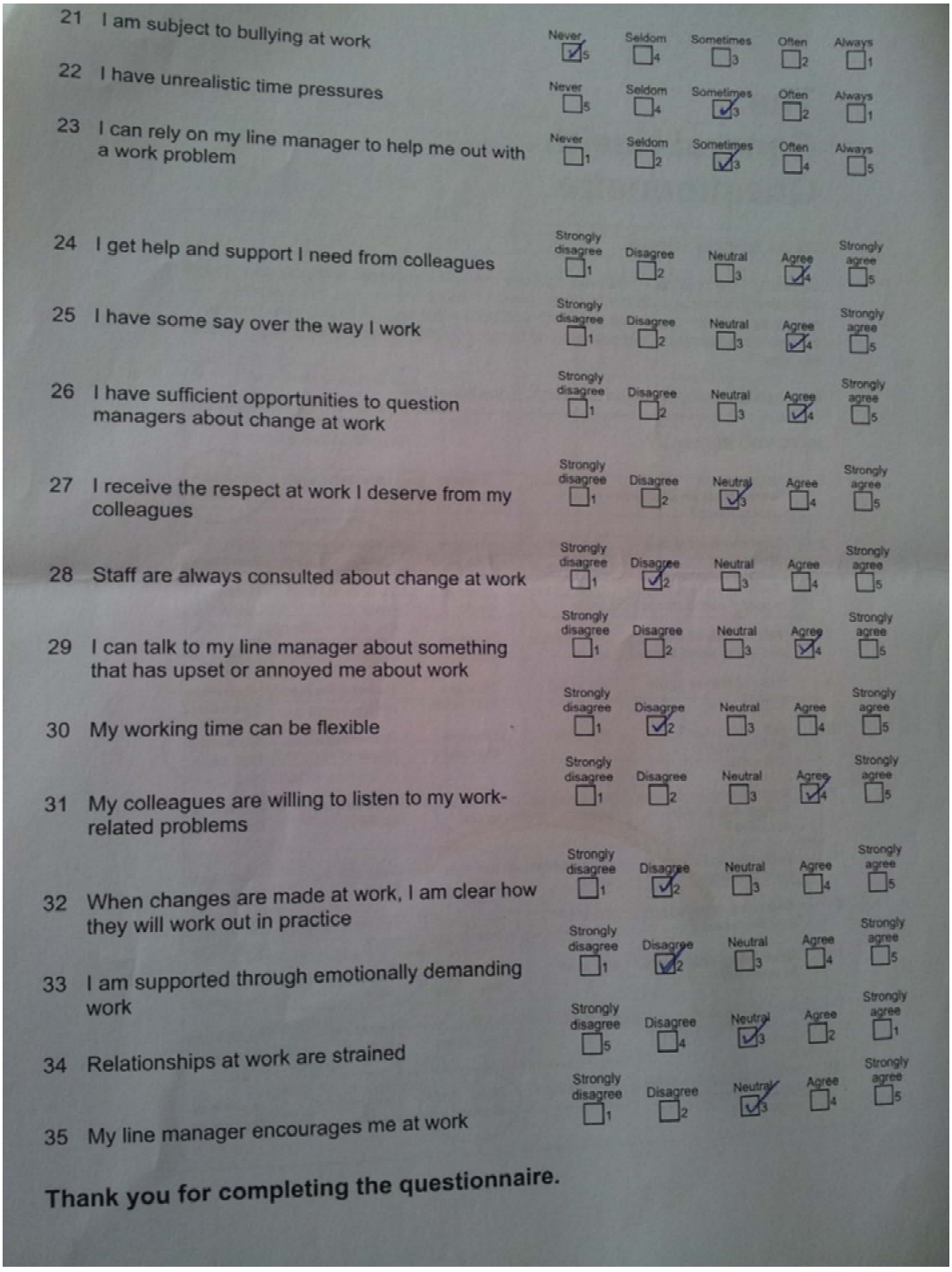
HSE INDICATOR TOOL
FOR
WORK RELATED STRESS

HSE Stress Indicator Measure (Contd.)



		Never	Seldom	Sometimes	Often	Always
1	I am clear what is expected of me at work	☐1	☐2	☑3	☐4	☐5
2	I can decide when to take a break	☐1	☐2	☐3	☑4	☐5
3	Different groups at work demand things from me that are hard to combine	☐5	☐4	☐3	☑2	☐1
4	I know how to go about getting my job done	☐1	☐2	☐3	☑4	☐5
5	I am subject to personal harassment in the form of unkind words or behaviour	☑5	☐4	☐3	☐2	☐1
6	I have unachievable deadlines	☐5	☐4	☑3	☐2	☐1
7	If work gets difficult, my colleagues will help me	☐1	☐2	☐3	☑4	☐5
8	I am given supportive feedback on the work I do	☐1	☐2	☑3	☐4	☐5
9	I have to work very intensively	☐5	☐4	☐3	☑2	☐1
10	I have a say in my own work speed	☐1	☐2	☐3	☑4	☐5
11	I am clear what my duties and responsibilities are	☐1	☐2	☑3	☐4	☐5
12	I have to neglect some tasks because I have too much to do	☐5	☐4	☐3	☐2	☑1
13	I am clear about the goals and objectives for my department	☐1	☐2	☐3	☐4	☑5
14	There is friction or anger between colleagues	☐5	☐4	☐3	☐2	☑1
15	I have a choice in deciding how I do my work	☐1	☐2	☑3	☐4	☐5
16	I am unable to take sufficient breaks	☑5	☐4	☐3	☐2	☐1
17	I understand how my work fits into the overall aim of the organisation	☐1	☐2	☐3	☑4	☐5
18	I am pressured to work long hours	☐5	☑4	☐3	☐2	☐1
19	I have a choice in deciding what I do at work	☐1	☐2	☑3	☐4	☐5
20	I have to work very fast	☐5	☐4	☑3	☐2	☐1

HSE Stress Indicator Measure (Contd.)



21	I am subject to bullying at work	Never ☑5	Seldom ☐4	Sometimes ☐3	Often ☐2	Always ☐1
22	I have unrealistic time pressures	Never ☐5	Seldom ☐4	Sometimes ☑3	Often ☐2	Always ☐1
23	I can rely on my line manager to help me out with a work problem	Never ☐1	Seldom ☐2	Sometimes ☑3	Often ☐4	Always ☐5
24	I get help and support I need from colleagues	Strongly disagree ☐1	Disagree ☐2	Neutral ☐3	Agree ☑4	Strongly agree ☐5
25	I have some say over the way I work	Strongly disagree ☐1	Disagree ☐2	Neutral ☐3	Agree ☑4	Strongly agree ☐5
26	I have sufficient opportunities to question managers about change at work	Strongly disagree ☐1	Disagree ☐2	Neutral ☐3	Agree ☑4	Strongly agree ☐5
27	I receive the respect at work I deserve from my colleagues	Strongly disagree ☐1	Disagree ☐2	Neutral ☑3	Agree ☐4	Strongly agree ☐5
28	Staff are always consulted about change at work	Strongly disagree ☐1	Disagree ☑2	Neutral ☐3	Agree ☐4	Strongly agree ☐5
29	I can talk to my line manager about something that has upset or annoyed me about work	Strongly disagree ☐1	Disagree ☐2	Neutral ☐3	Agree ☑4	Strongly agree ☐5
30	My working time can be flexible	Strongly disagree ☐1	Disagree ☑2	Neutral ☐3	Agree ☐4	Strongly agree ☐5
31	My colleagues are willing to listen to my work-related problems	Strongly disagree ☐1	Disagree ☐2	Neutral ☐3	Agree ☑4	Strongly agree ☐5
32	When changes are made at work, I am clear how they will work out in practice	Strongly disagree ☐1	Disagree ☑2	Neutral ☐3	Agree ☐4	Strongly agree ☐5
33	I am supported through emotionally demanding work	Strongly disagree ☐1	Disagree ☑2	Neutral ☐3	Agree ☐4	Strongly agree ☐5
34	Relationships at work are strained	Strongly disagree ☐5	Disagree ☐4	Neutral ☑3	Agree ☐2	Strongly agree ☐1
35	My line manager encourages me at work	Strongly disagree ☐1	Disagree ☐2	Neutral ☑3	Agree ☐4	Strongly agree ☐5

Thank you for completing the questionnaire.

Appendix 6: International Personality Item Pool Personality Measure

How would you describe yourself?

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	I am the life of the party.	SA	A	U	D	SD
2	Feel little concern for others.	SA	A	U	D	SD
3	Am always prepared.	SA	A	U	D	SD
4	Get stressed out easily.	SA	A	U	D	SD
5	Have a rich vocabulary.	SA	A	U	D	SD
6	Don't talk a lot.	SA	A	U	D	SD
7	Am interested in people.	SA	A	U	D	SD
8	Leave my belongings around.	SA	A	U	D	SD
9	Am relaxed most of the time.	SA	A	U	D	SD
10	Have difficulty understanding abstract ideas.	SA	A	U	D	SD
11	Feel comfortable around people.	SA	A	U	D	SD
12	Insult people.	SA	A	U	D	SD
13	Pay attention to details.	SA	A	U	D	SD
14	Worry about things.	SA	A	U	D	SD
15	Have a vivid imagination.	SA	A	U	D	SD
16	Keep in the background.	SA	A	U	D	SD
17	Sympathize with others' feelings.	SA	A	U	D	SD
18	Make a mess of things.	SA	A	U	D	SD
19	Seldom feel blue.	SA	A	U	D	SD
20	Am not interested in abstract ideas.	SA	A	U	D	SD
21	Start conversations.	SA	A	U	D	SD
22	Am not interested in other people's problems.	SA	A	U	D	SD
23	Get chores done right away.	SA	A	U	D	SD
24	Am easily disturbed.	SA	A	U	D	SD
25	Have excellent ideas.	SA	A	U	D	SD

		Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
26	Have little to say.	SA	A	U	D	SD
27	Have a soft heart.	SA	A	U	D	SD
28	Often forget to put things back in their proper place.	SA	A	U	D	SD
29	Get upset easily.	SA	A	U	D	SD
30	Do not have a good imagination.	SA	A	U	D	SD
31	Talk to a lot of different people at parties.	SA	A	U	D	SD
32	Am not really interested in others.	SA	A	U	D	SD
33	Like order.	SA	A	U	D	SD
34	Change my mood a lot.	SA	A	U	D	SD
35	Am quick to understand things.	SA	A	U	D	SD
36	Don't like to draw attention to myself.	SA	A	U	D	SD
37	Take time out for others.	SA	A	U	D	SD
38	Shirk my duties.	SA	A	U	D	SD
39	Have frequent mood swings.	SA	A	U	D	SD
40	Use difficult words.	SA	A	U	D	SD
41	Don't mind being the centre of attention.	SA	A	U	D	SD
42	Feel others' emotions.	SA	A	U	D	SD
43	Follow a schedule.	SA	A	U	D	SD
44	Get irritated easily.	SA	A	U	D	SD
45	Spend time reflecting on things.	SA	A	U	D	SD
46	Am quiet around strangers.	SA	A	U	D	SD
47	Make people feel at ease.	SA	A	U	D	SD
48	Am exacting in my work.	SA	A	U	D	SD
49	Often feel blue.	SA	A	U	D	SD
50	Am full of ideas.	SA	A	U	D	SD

Appendix 7: CISS (Adapted)

Strategies for Coping

When faced with a problem how do you react? There is no right or wrong answer. Please circle the response, which is most appropriate for you.

		Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1	I focus on the problem and take positive action	SA	A	U	D	SD
2	I become upset and feel ill	SA	A	U	D	SD
3	I go to the cinema	SA	A	U	D	SD
4	I learn from problems I have had to solve in the past	SA	A	U	D	SD
5	I fall to pieces when faced with problems	SA	A	U	D	SD
6	I go out and visit friends	SA	A	U	D	SD
7	I make a plan and put it into action	SA	A	U	D	SD
8	I feel anxious and worry that I am not able to cope	SA	A	U	D	SD
9	I go to bed and sleep	SA	A	U	D	SD
10	I try extra hard to solve the problem	SA	A	U	D	SD
11	I sometimes feel that problems are my own fault	SA	A	U	D	SD
12	I think everything will be OK and don't worry	SA	A	U	D	SD
13	I rise to the challenge	SA	A	U	D	SD
14	I take it out on others	SA	A	U	D	SD
15	I treat myself to make me feel better	SA	A	U	D	SD
16	I can generally cope with problems that arise	SA	A	U	D	SD
17	I feel tense when faced with a problem	SA	A	U	D	SD

18	I spend time with/talk to a special friend	SA	A	U	D	SD
19	I act to solve a problem the moment it arises	SA	A	U	D	SD
20	I seek sympathy and help	SA	A	U	D	SD
21	I try and take a break away from the situation	SA	A	U	D	SD
22	I analyse the situation and the information available and think through the options	SA	A	U	D	SD
23	I get angry and upset	SA	A	U	D	SD
24	I watch television	SA	A	U	D	SD

Appendix 8: The General Health Questionnaire 12

The General Health Questionnaire

Please read this carefully.

We should like to know if you have had any medical complaints and how your health has been in general, *over the last few weeks*. Please answer ALL the questions simply by underlining the answer which you think most applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

It is important that you try and answer ALL the questions.

HAVE YOU RECENTLY:

1 -	**Been able to concentrate on whatever you're doing?**	Better than usual	Same as usual	Less than usual	Much less than usual
2 -	**Lost much sleep over worry?**	Not at all	No more than usual	Rather more than usual	Much more than usual
3 -	**Felt that you are playing a useful part in things?**	More so than usual	Same as usual	Less useful than usual	Much less useful
4 -	**Felt capable of making decisions about things?**	More so that usual	Same as usual	Less so than usual	Much less capable
5 -	**Felt constantly under strain?**	Not at all	No more than usual	Rather more than usual	Much more than usual
6 -	**Felt you couldn't overcome your difficulties?**	Not at all	No more than usual	Rather more than usual	Much more than usual
7 -	**Been able to enjoy your normal day-to-day activities?**	More so than usual	Same as usual	Less so than usual	Much less than usual
8 -	**Been able to face up to your problems?**	More so than usual	Same as usual	Less able than usual	Much less able
9 -	**Been feeling unhappy and depressed?**	Not at all	No more than usual	Rather more than usual	Much more than usual
10 -	**Been losing confidence in yourself?**	Not at all	No more than usual	Rather more than usual	Much more than usual
11 -	**Been thinking of yourself as a worthless person?**	Not at all	No more than usual	Rather more than usual	Much more than usual
12-	**Been feeling reasonably happy, all things considered?**	More so than usual	About same as usual	Less so than usual	Much less than usual

Appendix 9: CISS 24 Initial solution Component matrix

	Component						
	1	2	3	4	5	6	7
I fall to pieces when faced with problems	-.744						
I focus on the problem and take positive action	.733						
I rise to the challenge	.707						
I make a plan and put it into action	.656	.325					
I can generally cope with problems that arise	.643				.364		
I feel anxious and worry that I am not able to cope	-.575	.384	.364				
I become upset and feel ill	-.569		.371				
I act to solve a problem the moment it arises	.555				-.440		
I learn from problems I have had to solve in the past	.554						
I treat myself to make me feel better		.607			.317		
I go out and visit friends		.598	-.398				
I seek sympathy and help		.523		-.442			
I spend time with/talk to a special friend		.505		-.427		-.366	
I analyse the situation and the information available and think through the options							
I watch television		.369	-.577			.302	
I go to the cinema		.545	-.568				
I feel tense when faced with a problem	-.420	.325	.438				

	Component					
I try and take a break away from the situation		-.422	.352			
I try extra hard to solve the problem	.471	.312	.563			
I go to bed and sleep		-.371	-.497		.343	
I sometimes feel that problems are my own fault	-.357			.616		
I take it out on others			-.386	.319	.516	
I get angry and upset	-.320				-.313	.547
I think everything will be ok and don't worry		-.396				.518

Extraction Method: Principal Component Analysis.

7 components extracted.

Appendix 10: Five Factor Rotated Component Matrix (< .4 loadings suppressed)

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
I make a plan and put it into action	.780				
I focus on the problem and take positive action	.728				
I try extra hard to solve the problem	.708				
I rise to the challenge	.615				
I learn from problems I have had to solve in the past	.609				
I can generally cope with problems that arise	.532	-.494			
I analyse the situation and the information available and think through the options					
I become upset and feel ill		.764			
I feel anxious and worry that I am not able to cope		.727			
I feel tense when faced with a problem		.679			
I fall to pieces when faced with problems	-.462	.604			
I think everything will be OK and don't worry		-.412			
I go to the cinema			.806		
I watch television			.760		
I go out and visit friends			.620		
I treat myself to make me feel better			.559		
I try and take a break away from the situation					
I seek sympathy and help				.694	
I spend time with/talk to a special friend				.657	

Rotated Component Matrix[a]			
I take it out on others		.488	
I go to bed and sleep		.443	
I sometimes feel that problems are my own fault			.728
I act to solve a problem the moment it arises	.507		-.540
I get angry and upset			.402

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Appendix 11: Five Factor Rotated Component matrix (<.3 loadings suppressed)

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
I make a plan and put it into action	.780				
I focus on the problem and take positive action	.728	-.302			
I try extra hard to solve the problem	.708			-.311	
I rise to the challenge	.615				-.395
I learn from problems I have had to solve in the past	.609				
I can generally cope with problems that arise	.532	-.494			
I analyse the situation and the information available and think through the options	.330				
I become upset and feel ill		.764			
I feel anxious and worry that I am not able to cope		.727			
I feel tense when faced with a problem		.679			
I fall to pieces when faced with problems	-.462	.604			
I think everything will be OK and don't worry		-.412			
I go to the cinema			.806		
I watch television			.760		
I go out and visit friends			.620	.366	
I treat myself to make me feel better	.358		.559		
I try and take a break away from the situation			.382	-.355	
I seek sympathy and help				.694	
I spend time with/talk to a special friend				.657	

Rotated Component Matrix[a]			
I take it out on others		.488	.343
I go to bed and sleep	-.322	.443	-.342
I sometimes feel that problems are my own fault			.728
I act to solve a problem the moment it arises	.507		-.540
I get angry and upset			.402

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Appendix 12: Three factor rotated matrix (varimax) (<.3 loadings suppressed)

Rotated Component Matrix[a]			
	Component		
	1	2	3
I make a plan and put it into action	.751		
I focus on the problem and take positive action	.746		
I rise to the challenge	.728		
I act to solve a problem the moment it arises	.651		
I fall to pieces when faced with problems	-.593	.442	
I learn from problems I have had to solve in the past	.565		
I try extra hard to solve the problem	.564		
I can generally cope with problems that arise	.564	-.322	
I spend time with / talk to a special friend	.399		
I analyse the situation and the information available and think through the options			
I feel anxious and worry that I am not able to cope		.737	
I become upset and feel ill		.696	
I feel tense when faced with a problem		.682	
I seek sympathy and help		.473	
I think everything will be OK and don't worry		-.412	
I sometimes feel that problems are my own fault		.373	
I get angry and upset		.360	
I try and take a break away from the situation		-.336	
I take it out on others			
I go to the cinema			.794
I go out and visit friends			.717
I watch television	-.310		.675
I treat myself to make me feel better			.555
I go to bed and sleep			.357

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 13: Three Factor Solution Rotated Component Matrix (<4)

Rotated Component Matrix[a]			
	Component		
	1	2	3
I make a plan and put it into action	.751		
I focus on the problem and take positive action	.746		
I rise to the challenge	.728		
I act to solve a problem the moment it arises	.651		
I fall to pieces when faced with problems	-.593	.442	
I learn from problems I have had to solve in the past	.565		
I try extra hard to solve the problem	.564		
I can generally cope with problems that arise	.564		
I spend time with/talk to a special friend			
I analyse the situation and the information available and think through the options			
I feel anxious and worry that I am not able to cope		.737	
I become upset and feel ill		.696	
I feel tense when faced with a problem		.682	
I seek sympathy and help		.473	
I think everything will be OK and don't worry		-.412	
I sometimes feel that problems are my own fault			
I get angry and upset			
I try and take a break away from the situation			
I take it out on others			
I go to the cinema			.794
I go out and visit friends			.717
I watch television			.675
I treat myself to make me feel better			.555
I go to bed and sleep			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 14: Factor analysis - 3 factor solution with 4 items removed

Rotated Component Matrix[a]			
	Component		
	1	2	3
I make a plan and put it into action	.778		
I focus on the problem and take positive action	.757		
I rise to the challenge	.707		
I try extra hard to solve the problem	.653		
I act to solve a problem the moment it arises	.638		
I learn from problems I have had to solve in the past	.590		
I can generally cope with problems that arise	.540	-.373	
I fall to pieces when faced with problems	-.527	.527	
I feel anxious and worry that i am not able to cope		.756	
I feel tense when faced with a problem		.725	
I become upset and feel ill		.717	
I sometimes feel that problems are my own fault		.395	
I get angry and upset		.374	
I go to bed and sleep		-.373	.340
I seek sympathy and help		.354	
I go to the cinema			.826
I watch television			.712
I go out and visit friends			.702
I treat myself to make me feel better			.558
I try and take a break away from the situation			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 15: Factor Analysis - Final solution (19 items)

Rotated Component Matrix[a]			
	Component		
	1	2	3
I make a plan and put it into action	.781		
I focus on the problem and take positive action	.757		
I rise to the challenge	.692		
I try extra hard to solve the problem	.662		
I act to solve a problem the moment it arises	.615		
I learn from problems I have had to solve in the past	.600		
I can generally cope with problems that arise	.546	-.355	
I feel anxious and worry that i am not able to cope		.759	
I feel tense when faced with a problem		.722	
I become upset and feel ill		.713	
I fall to pieces when faced with problems	-.522	.526	
I go to bed and sleep		-.426	.367
I sometimes feel that problems are my own fault		.420	
I get angry and upset		.377	
I seek sympathy and help		.310	
I go to the cinema			.829
I go out and visit friends			.719
I watch television			.698
I treat myself to make me feel better	.309		.538

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 16: Spearman's Rho Correlations with GHQ12 before relocation

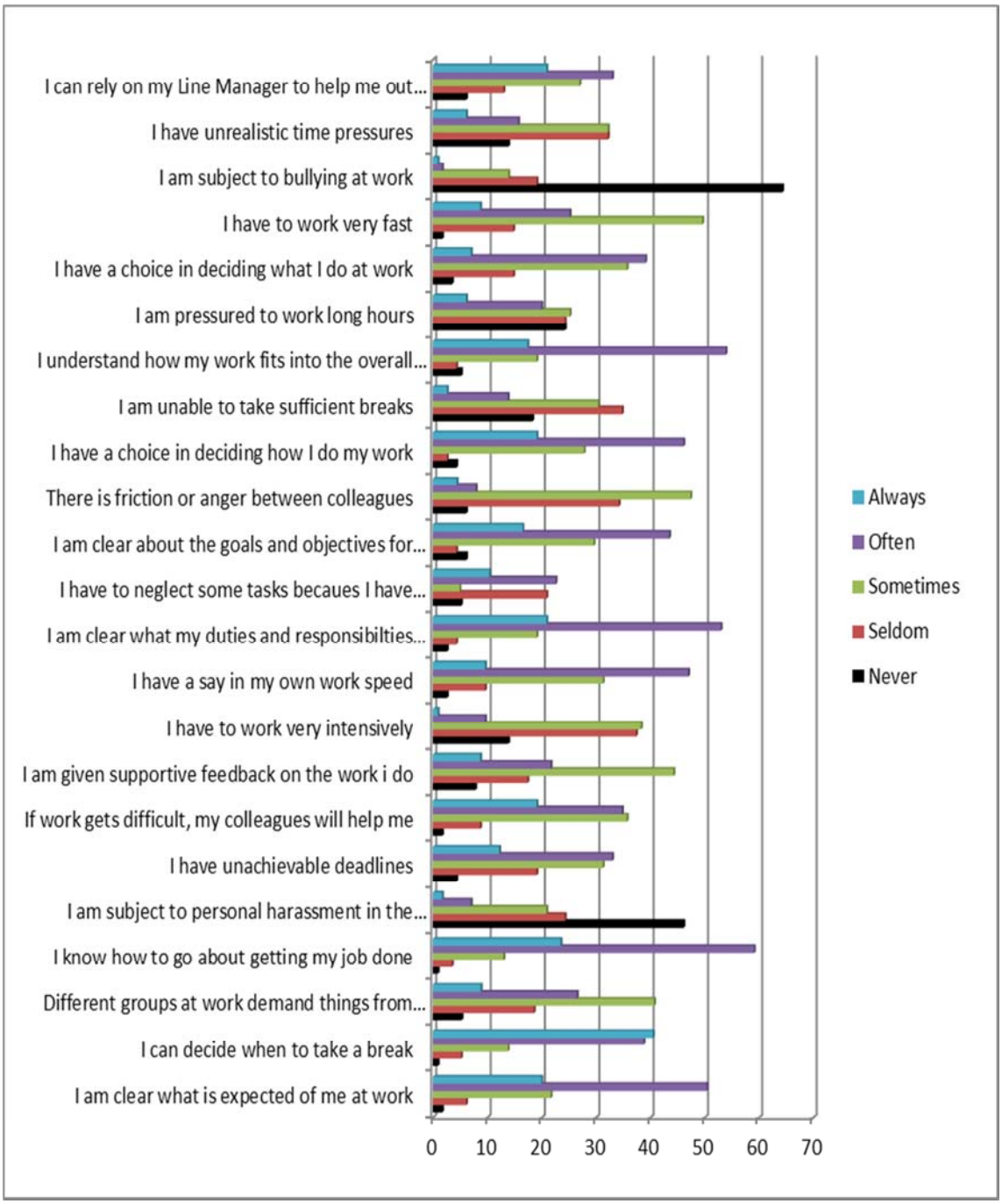
	Rho	P
Age	.209	0.015*
Job Sat	.373	.000**
Demands	-.430	.000**
Control	-.452	.011**
Managers' Support	-.479	.000**
Peer Support	-.404	.000**
Relationships	-.583	.000**
Role	-.386	.000**
Change	-.454	.000**

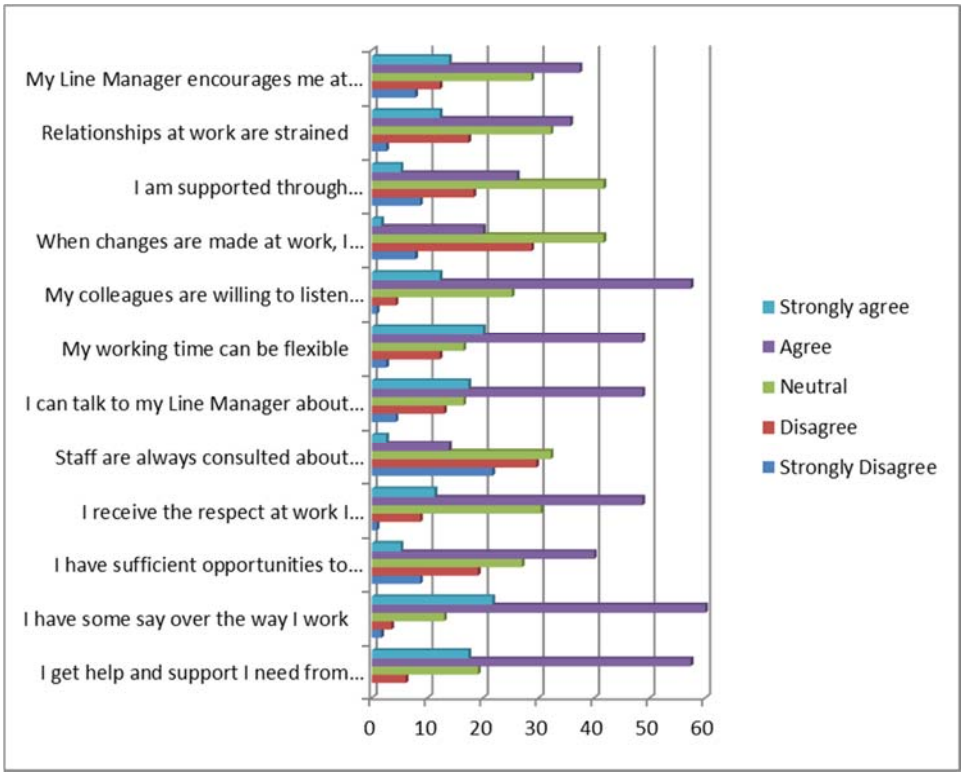
HSE tool items requiring urgent action			
Question 1	-.382	–	.000**
Question 3	-.369	–	.000**
Question 11	-.374	–	.000**
Question 13	-.34	–	.000**
Question 17	-.235	–	.005**
Question 21	-.451	–	.005**
Question 24	-.384	–	.000**
Question 27	-.376	–	.000**
Question 31	-.292	–	.000**

***Correlation is significant at the .01 level*

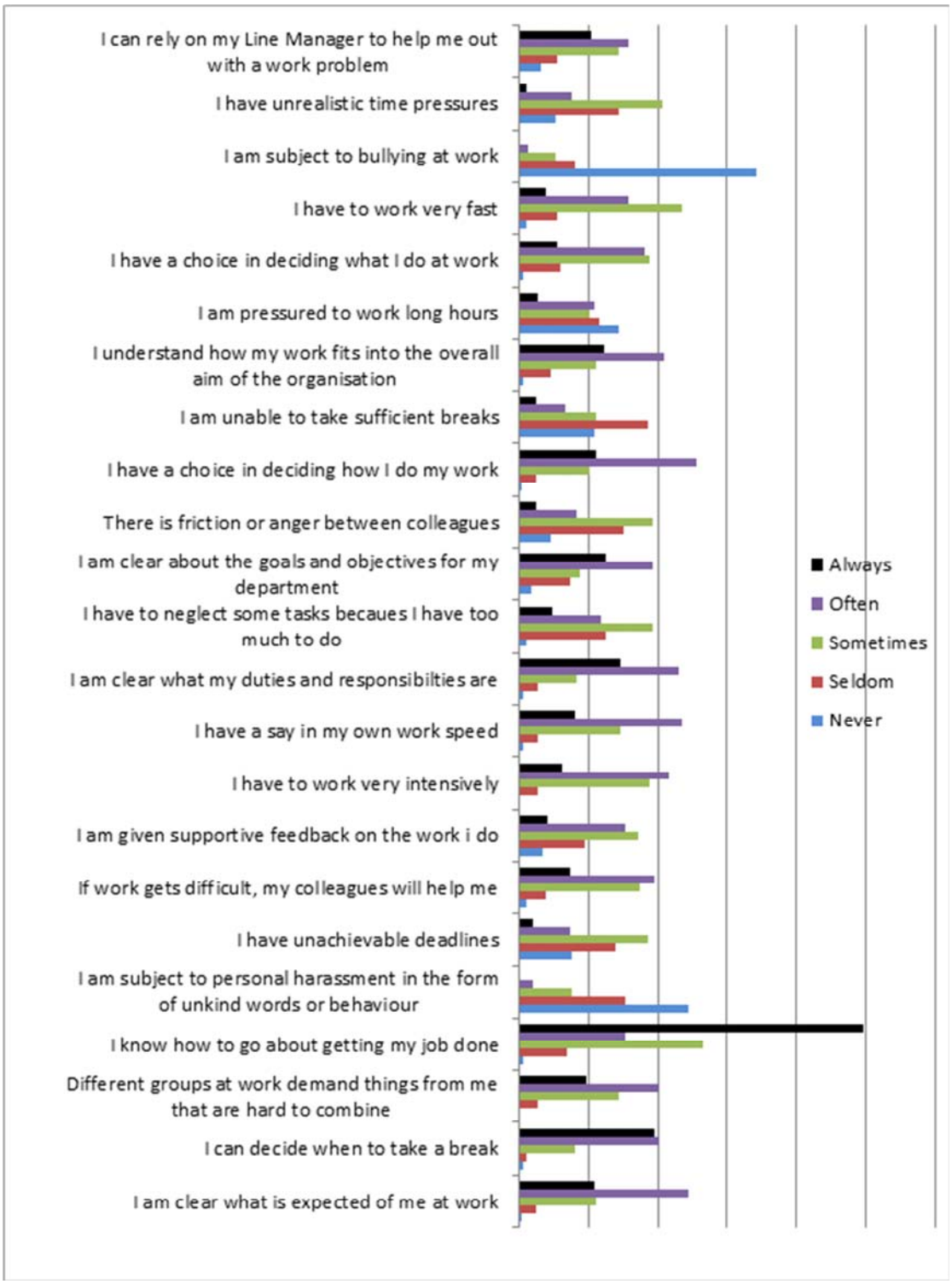
**Correlation is significant at the .05 level*

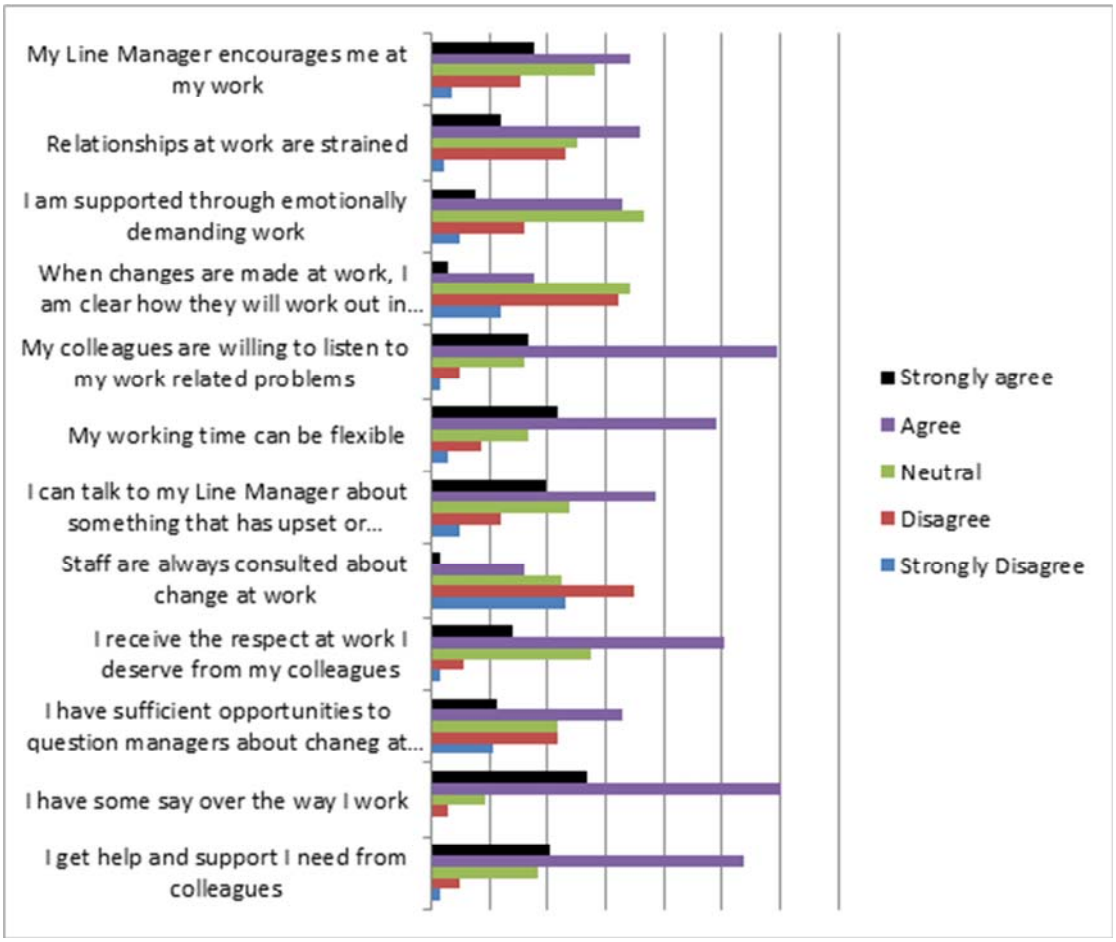
Appendix 17: Sources of Stress – Graphic display of Responses to individual items at T2




My Line Manager encourages me at...
Relationships at work are strained
I am supported through...
When changes are made at work, I...
My colleagues are willing to listen...
My working time can be flexible
I can talk to my Line Manager about...
Staff are always consulted about...
I receive the respect at work I...
I have sufficient opportunities to...
I have some say over the way I work
I get help and support I need from...
0
10
20
30
40
50
60
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree

Appendix 18a: Sources of Stress – Responses to individual items T1




My Line Manager encourages me at my work
Relationships at work are strained
I am supported through emotionally demanding work
When changes are made at work, I am clear how they will work out in...
My colleagues are willing to listen to my work related problems
My working time can be flexible
I can talk to my Line Manager about something that has upset or...
Staff are always consulted about change at work
I receive the respect at work I deserve from my colleagues
I have sufficient opportunities to question managers about chaneg at...
I have some say over the way I work
I get help and support I need from colleagues
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree

Appendix 18b: Per cent Responses to Sources of Stress questionnaire items at T1 (%)[6]

Question (T1)	Never	Seldom	Sometimes	Often	Always
I am clear what is expected of me at work	0.7	4.9	22.4	49	21.7
I can decide when to take a break	1.4	2.1	16.1	40.6	39.2
Different groups at work demand things from me that are hard to combine	0	5.6	28.7	40.6	19.6
I know how to go about getting my job done	1.4	14	53.1	30.8	99.3
I am subject to personal harassment in the form of unkind words or behaviour	49	30.8	15.4	4.2	0
I have unachievable deadlines	15.4	28	37.1	14.7	4.2
If work gets difficult, my colleagues will help me	2.1	7.7	35	39.2	14.7
I am given supportive feedback on the work I do	7	18.9	34.3	30.8	8.4
I have to work very intensively	0	5.6	37.8	43.4	12.6
I have a say in my own work speed	1.4	5.6	29.4	46.9	16.1
I am clear what my duties and responsibilities are	1.4	5.6	16.8	46.2	29.4
I have to neglect some Tasks because I have too much to do	2.1	25.2	38.5	23.8	9.8
I am clear about the goals and objectives for my department	3.5	14.7	17.5	38.5	25.2
There is friction or anger between colleagues	9.1	30.1	38.5	16.8	4.9
I have a choice in deciding how I do my work	0.7	4.9	20.3	51	22.4

[6] For comparative purposes and to facilitate interpretation these responses are also graphically displayed in Appendix 1.

Question (T1)	Never	Seldom	Sometimes	Often	Always
I am unable to take sufficient breaks	21.7	37.1	22.4	13.3	4.9
I understand how my work fits into the overall aim of the organization	1.4	9.1	22.4	42	24.5
I am pressured to work long hours	28.7	23.1	20.3	21.7	5.6
I have a choice in deciding what I do at work	1.4	11.9	37.8	36.4	11.2
I have to work very fast	2.1	11.2	46.9	31.5	7.7
I am subject to bullying at work	68.5	16.1	10.5	2.8	0
I have unrealistic time pressures	10.5	28.7	41.3	15.4	2.1
I can rely on my line manager to help me out with a work problem	6.3	11.2	28.7	31.5	21

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
I get help and support I need from colleagues	1.4	4.9	18.2	53.8	20.3
I have some say over the way I work	0	2.8	9.1	60.1	26.6
I have sufficient opportunities to question managers about change at work	10.5	21.7	21.7	32.9	11.2
I receive the respect at work I deserve from my colleagues	1.4	5.6	27.3	50.3	14
Staff are always consulted about change at work	23.1	35	22.4	16.1	1.4
I can talk to my line manager about something that has upset or annoyed me about work	4.9	11.9	23.8	38.5	19.6
My working time can be flexible	2.8	8.4	16.8	49	21.7
My colleagues are willing to listen to my work related problems	1.4	4.9	16.1	59.4	16.8
When changes are made at work, I am clear how they will work out in practice	11.9	32.2	34.3	17.5	2.8

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
I am supported through emotionally demanding work	4.9	16.1	36.4	32.9	7.7
Relationships at work are strained	2.1	23.1	25.2	35.7	11.9
My Line-manager encourages me at my work	3.5	15.4	28	34.3	17.5

Appendix 19: Differences between Academic and Non-academic staff groups before Relocation

	Academic[b]	Non-academic [b]	N	Test statistics	Z	P	R
Mean GHQ score	14.1	14.1	110	U=2078.5	-0.101	0.92	
Probable Psychiatric 'case' [a]	27 (40%)	23 (39%)	127	$x^2(1)=-.007$		0.934	
Non-Case	41 (60%)	36 (61%)					
Job Satisfaction			126	$x^2(2)=3.596$		0.166	
Satisfied	34	39					
Dissatisfied	11	12					
Unsure	20	61					
Stressor (mean rank):							
Demands	53.64	78.92	130	U=1286	-3.825	.000**	-.33
Manager Support	60.66	71.15	130	U=1761	-1.588	0.112	-.14
Peer Support	60.35	71.51	130	U=1739.5	-1.701	0.089	-.15
Relationships	58.79	73.09	130	U=1641.5	-2.174	0.03*	-.19
Role	56.24	76.64	130	U=1437	-3.089	0.002*	-.27
Change	58.02	73.96	130	U=1588.5	-2.422	0.015*	-.21
Control	67.81	62.8	130	U=1938	-0.76	0.447	-.07

**sig at .05 level **sig at .001 level*

[a]Probable case (>/=4); Non-Case (<4)

Academic category refers to Lecturers (n=55), Professors (n=5), Research Fellows (n=8); Research Assistants (n=3)

Appendix 20 Differences between Academic and Non-academic staff after relocation

	Academic[b]	Non-academic[b]	N	Z	P	R
Mean GHQ score	16.04	13.7	104	-1.430	.153	-
Probable Psychiatric 'case' [a]	25 (59%)	17 (40%)		X2(1)=2.2067	0.151	-
Non-Case	28 (45%)	34 (55%)				
Job Satisfaction			110		.333	-
Satisfied	33	31				
Dissatisfied	14	9				
Unsure	56	54				
Stressor (mean rank):						
Demands	43.39	65.22	109	-3.642	.000**	-0.35
Manager Support	62.14	47.73	109	-2.386	.017*	-0.23
Peer Support	58.96	50.96	109	-1.333	0.183	-
Relationships	55.99	52.95	108	-0.508	0.612	-
Role	53.56	56.46	109	-0.482	0.63	-
Change	57.17	52.79	109	-0.729	0.466	-
Control	61.31	48.57	109	-2.112	.035*	-0.2

***sig at .05 level **sig at .001 level**

[a]Probable case (>/=4); Non-Case (<4)

Academic category refers to: Lecturers, Professors, Research Fellows; Research Assistants

Appendix 20: Differences between Male and Female Staff Groups before Relocation

	Male	Female	N	Test statistics	Z	P	R
Mean GHQ score	26.98 (n=36)	26.04 (n=102)	138	U=1709.5	-.615	0.538	-.052
Probable Psychiatric 'case' [a]	16 (44%)	41 (41%)	135	$x^2(1)=.099$		0.753	
Non-Case	20 (56%)	58 (59%)					
Job Satisfaction			134	$x^2(2)=3.558$		0.169	
Satisfied	21 (64%)	56 (55%)					
Dissatisfied	8 (24%)	17 (17%)					
Unsure	4 (12%)	28 (28%)					
Stressor (mean rank)							
Demands	60.89	72.43	138	U=1501	-1.478	0.139	-.126
Manager Support	59.51	72.89	138	U=1453	-1.716	0.086	-.146
Peer Support[b]	58.17	73.35	138	U=1406	-1.96	0.05	-.167
Relationships	63.91	71.4	138	U=1607	-0.963	0.336	-.082
Role	63.22	71.72	138	U=1610	-1.101	0.271	-.094
Change	60.9	71.78	138	U=1501.5	-1408	0.159	-.119
Control	63.56	71.52	137	U=1595.5	-1.022	0.307	-.0873

Note: no significant differences identified

[a]probable case (>/=4); Non-Case (<4);

[p]approaching significance

Appendix 21: Mann-Whitney U tests of difference between married and unmarried employees

At T1	Group	N	Mean Rank	SE	Statistic	P
GHQ12	Married Unmarried	74 74	67.10 71.23	230.9	U=2471.5 Z=.543	.543
Demands	Married Unmarried	74 63	64.24 74.60	231.2	U=2683.5 Z=1.525	.127
Control	Married Unmarried	74 63	75.11 61.83	230.5	U=1879 Z=230.5	.050
Managers Support	Married Unmarried	75 62	72.36 64.94	230.5	U=2073 Z=-1.093	.274
Peer Support	Married Unmarried	75 62	71.33 66.19	228.9	U=2150.5 Z=-.762	.446
Relationships	Married Unmarried	74 63	68.87 69.15	229.9	U=2340.5 Z=.041	.967
Role	Married Unmarried	74 63	69.78 69.08	230.3	U=2273 Z=-.252	.801
Change	Married Unmarried	73 63	71.99 64.45	227.7	U=2044.5 Z=-1.120	.263
Job satisfaction	Married Unmarried	74 63	67.10 71.23	230.8	U=2471.5 Z=.609	.990

At T2	Group	N	Mean Rank	SE	Statistic	P
GHQ12	Married Unmarried	59 48	58.25 48.77	159	U=1165 Z=-1.575	.115
Demands	Married Unmarried	61 49	55.86 55.05	166	U=1472.5 Z=-.133	.895
Control	Married Unmarried	61 51	57.59 55.20	170	U=1489 Z=-.390	.696
Managers Support	Married Unmarried	61 51	52.72 61.02	171	U=1786 Z=1.351	.177
Peer Support	Married Unmarried	61 51	50.84 63.27	170	U=1901 Z=2.037	*.042
Relationships	Married Unmarried	60 51	53.36 59.11	168	U=1688.5 Z=.945	.345

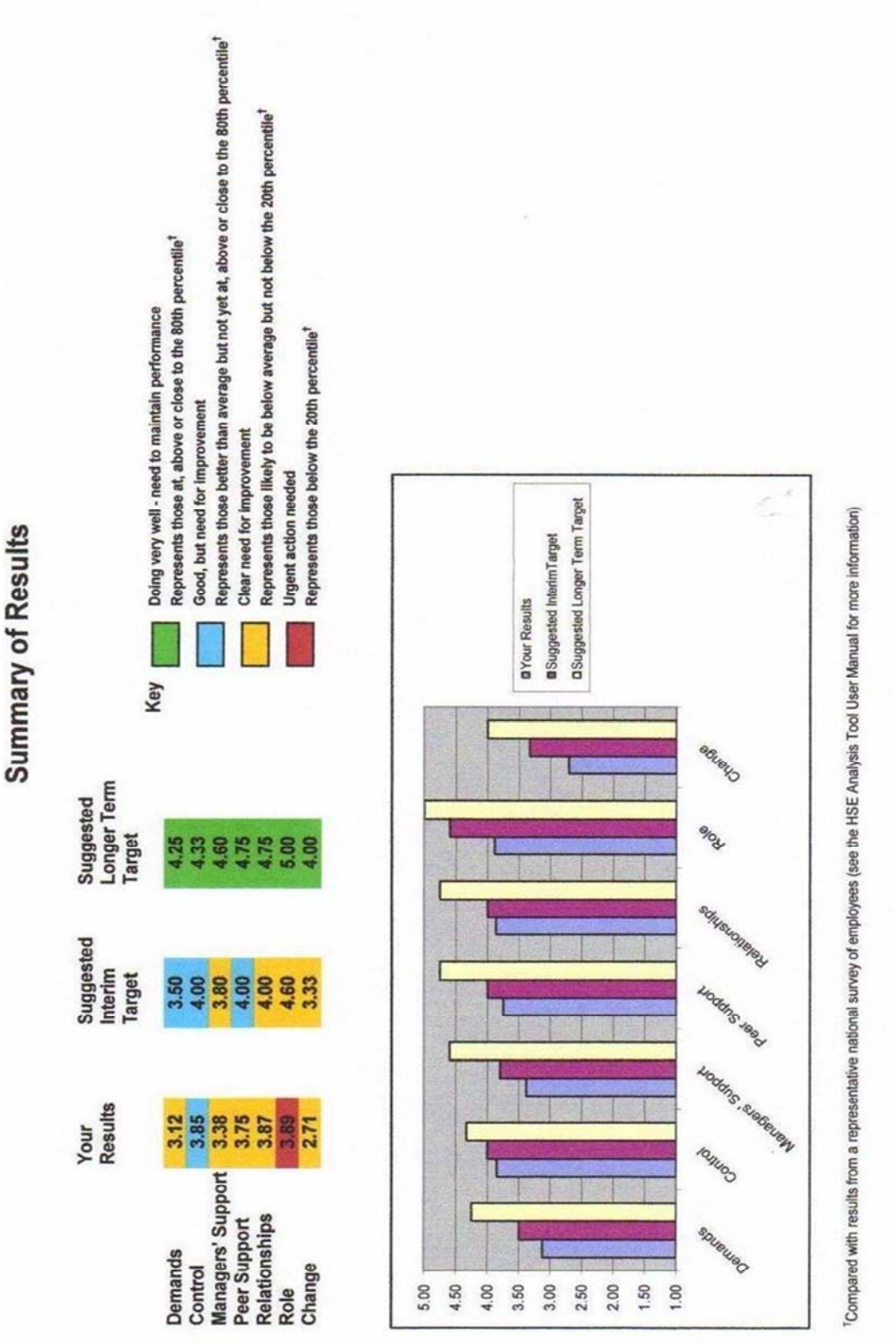
At T2	Group	N	Mean Rank	SE	Statistic	P
Role	Married	61	54.16	161	U=1698	.402
	Unmarried	51	59.29		Z=.838	
Change	Married	61	51.23	170	U=1877	.059
	Unmarried	51	62.80		Z=1.891	
Job satisfaction	Married	61	56.16	154	U=1637.5	.737
	Unmarried	52	57.99		Z=.335	

Appendix 22: Mann-Whitney U analyses of differences between Complementary and Alternative therapy users and non-users

At T1	Group	N	Mean Rank	SE	Statistic	P
GHQ12	CAM yes CAM no	39 99	79.7 65.5	210	U=1532.5 Z= -1.887	.059
Demands	CAM yes CAM no	38 100	59.2 73.4	209	U=2291 Z= 1.867	.062
Control	CAM yes CAM no	38 100	69.9 69.3	209	U=1884 Z=-.077	.939
Managers Support	CAM yes CAM no	38 100	63.8 71.7	209	U=2117 Z=-1.04	.298
Peer Support	CAM yes CAM no	38 100	65.0 71.2	207	U=-2069 Z=-.816	.414
Relationships	CAM yes CAM no	38 100	60.5 72.9	208	U=2242 Z=-1.64	.101
Role	CAM yes CAM no	39 99	61.4 72.7	120	U=2245 Z=-1.49	.135
Change	CAM yes CAM no	38 99	65.12 70.49	207	U=2028 Z=.713	.476

At T2	Group	N	Mean Rank	SE	Statistic	P
GHQ12	CAM yes CAM no	34 76	57.56 54.58	154.3	U=1222 Z= -.454	.650
Demands	CAM yes CAM no	34 79	57.83 55.07	159.5	U=1408.5 Z= .411	.681
Control	CAM yes CAM no	35 80	59.20 55.26	163.8	U=1496 Z= .586	.558
Managers Support	CAM yes CAM no	35 80	58.05 57.89	163.9	U= 1404 Z=.024	.981
Peer Support	CAM yes CAM no	35 80	54.86 65.17	163.1	U=1149 Z=-1.539	.124
Relationships	CAM yes CAM no	35 79	50.96 60.40	161.5	U=1611.5 Z =1.418	.156
Role	CAM yes CAM no	35 80	58.17 57.92	163.4	U= 1394 Z=-.037	..971
Change	CAM yes CAM no	35 80	61.44 56.49	163.4	U=1279.5 Z=-.738	.461
Job satisfaction	CAM yes CAM no	36 80	64.46 55.82	149.5	U=1225.5 Z=-1.435	.151

Appendix 23: Suggested stress targets identified before relocation



Appendix 24: Evaluative studies of stress interventions in University employees

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Hartfiel et al. (2011)	*Design:* Randomised wait-list controlled trial. Sample self-selected by intranet & flyer and randomly allocated to intervention or wait-list control. Outcomes assessed at baseline and six week follow-up. *Methods appraisal score:* 5 [Individual criteria met: 1, 4, 5, 7, 10] *Aim:* To determine the effectiveness of yoga for reducing psychological stress and enhancing emotional psychological distress. *Analyses:* Two way Annova's (n=8) on outcome measure domains with Bonferroni correction assessments; Baseline comparison (t-tests) of groups on outcome measures revealed no significant differences.	*Setting:* British University employees (N=48). *Participants:* Majority female (n=36); mean age 39.3 years; range not reported. Job status, type, education, marital status = NR. Intervention: (N=20); 17 female; 3 male. Mean age = 40.6 (SD = 11.40); working hours = 36.22. Control: (N = 20); 19 female; 1 Male. Mean age = 38 (SD = 9.58); working hours = 34.64. Differing health conditions reported at baseline: Stress [intervention (5), Control (8)], Headaches [Intervention (4) Control (7)], Weight problems [Interventions (4) Control (7)], Lack of energy [Intervention (7), Control (4)]; Back problems [Intervention (6), Control (4)].	*Intervention:* Six week Yoga program. [Individual; single] *Content:* 60 min classes taught by senior instructor; Accompanied by CD including guided 35 min session; participants complete home practice record form; Consisted of a variety of movements and postures, directed breathing, and relaxation including affirmation and visualisation. Each class divided into 4 stages: 'activation exercises, 'energy-block' release sequences, postures, and relaxation'.	*Response, Implementation and process outcomes:* Of 48 participants 40 completed baseline and post program outcome measures. No further information on drop-outs or adjustment reported. 55% (9/20) of final yoga group did not return home practice forms, no analysis of home practice conducted. Treatment dose / number of sessions attended varied. Minimum requirement was to attend 1 of 3 classes per week. Intervention group attended on average 1.15 classes per week. Some participants in control and intervention currently practicing yoga (3 in control group; 4 in yoga group). Excluded respondents with yoga experience allowed to participate in intervention classes. *On-going Program:* No	*Measures:* Profile of Mood States Bipolar ↑ Inventory of Positive Psychological Attitudes ↑ *Details:* Significant improvement for intervention in 5 of 6 POMS and all IPPA domains. No sig change in hostility between groups. Intervention group reported feeling significantly less anxious, confused, depressed, tired and unsure and had a greater sense of life purpose and satisfaction and were more self-confident during stressful situations. *Effect size (η2)* Composed –anxious: 0.19 Clear-minded-confused: 0.19 Elated-depressed: 0.16 Energized-tired: 0.22 Agreeable-hostile: 0.05 Confident-unsure: 0.16 Life purpose satisfaction: 0.17 Self-confidence during stress: 0.25

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Sandstrom (2009)	*Design:* Randomised controlled trial. Sample randomly allocated to intervention or control. Outcomes assessed at baseline and six week follow-up. Outcomes assessed at baseline and post intervention at approximately 8 weeks by mail questionnaire. *Methods appraisal score:* 5 [Individual criteria met: 1, 4, 5, 6, 9, 10] *Aim:* To determine the effects of therapeutic massage on stress reduction and overall quality of life. *Analyses:* t- tests to assess change from T1 to T2. Differences between groups assessed at T1 and again at T2 using paired means tests. Analyses of baseline group characteristics showed intervention group had significantly higher stress levels than control at baseline. No difference in groups self-reported ability to manage stress (single item q s, t = -0.10, p = .924)) or to manage stress according to job rank (ANOVA, F = 1.13, p = .357).	*Setting:* Minot State University, North Dakota, U.S. *Participants:* 27 academic female University employees; average 8.4 years of experience. Age, education, marital status = NR. Control: N = 15; 11 full time staff; 8.37 years of experience. Intervention: N = 12; no full time employees; 10.33 years of experience. While not explored or accounted for statistically, some participants reported diagnoses (such as depression or anxiety) and taking related medications.	*Intervention:* 3 (x 1 hour) Massage sessions (Timeline of sessions unclear but between Sep 5th and Oct 31st, 2006). [Individual; single] *Content:* Incorporated various massage methods (myofacial release, deep tissue massage, acupressure, stone massage therapy); differed for participants; 'Reiki energy work' also provided but details NR; intervention implementation timeline not clear but over a 26 day period; location NR; trainer reported as licenced (accrediting body NR).	*Response, Implementation and process outcomes:* PHD dissertation project. Positive user feedback / comments reported post massage. Open ended responses provide participant description of contributors to work stress and strategies for managing stress. *On-going program?* No	*Measures:* Perceived Stress Scale (Cohen et al., 1983) ↑ Pre and post massage stress survey (unpublished, administered before and after each massage) ↑ *Details:* Scores on the Perceived Stress Scale decreased for the intervention group from T1 to T2 (T1 mean = 29.07, T2 mean = 12.80, SD = 4.74, t = - 13.28, p = .000) but not for the control group (T1 mean = 17.75, T2 mean = 19.17, SD = 8.02, t = 0.61, p = .000). No between group assessments of change statistics from time 1 to time 2 were conducted. *Effect size (r) :* d = 1.2 (on the PSS)

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Martin & Sanders (2003)	*Design:* Randomised controlled trial. Sample randomly allocated to intervention or wait-list control. Sample self-selected (all staff invited by email). Outcomes assessment pre and post program and at 4 months for the intervention group. *Methods appraisal score: 4* [Individual criteria met: 1, 4, 7, 10] *Aim:* To investigate the effectiveness of work-place interventions on family functioning. Predicted that due to role spill-over from home to work, participating parents will experience improvements in work functioning as a result of a behavioural family Intervention. Hypothesised that the program participants would experience less work- related stress. *Analyses:* Ancova's assessed pre-post change. T tests assessed change from post to 4month follow-up for intervention group. Baseline comparison (ANOVA; chi-squared) of groups on demographics and outcome measures revealed no significant differences (except ECBI problem score) (but stats not presented or available for confirmation). No differences between completer's and non-completers found after analysis. However no results presented for ANOVA's.	*Setting:* Brisbane, Australia *Participants:* University of Queensland employees (N=45); Majority of participants married (80%), in tertiary education (99%), in general staff positions (68%) and working on average 35 hours per week. Gender, job status = NR. Control: N = 22; 92% married; 99% in tertiary education; mean age = 37.2; 33% academic; Intervention: N = 23; mean age = 39.6; 74% married; 68% academic. Targeted specific employees with: a) child between the age of 2 and 9 years with behavioural problems in clinical range of intensity b) experiencing sig. level of distress managing work and home demands c) employed for at least 20 hours per week.	*Intervention:* Eight-week Triple P Positive Parenting Program. [Individual; multiple] *Content:* 4 (x 2hr) group sessions of parent training. After completing sessions participants received four individual telephone consultations (15-30 minutes) and a copy of 'Every parent's group workbook' containing key learning principles and exercises. The program consisted of teaching parents 17 core positive parenting and child management Strategies through a variety of active training methods (incl. video modelling; rehearsal; feedback & goal setting). Key transition times such as getting ready for work specifically targeted	*Response, Implementation and process outcomes:* Two Masters level Psychologists (accredited program providers) conducted all sessions. Manualised program with protocol adherence checklists. Intervention-23 assigned; 19 (83%) completed all 8 weeks, post measures received from 16 (69%); 8 provided 4 month follow up data (34%). Control-22 assigned; 16 (73%) completed pre-test measures; 11 post-test measures received (50%). No further info on drop-outs reported. Analyses (stated, not presented) found no significant differences between completers and drop-outs. *On-going program?* Not in study group. Program continues elsewhere: http://www.triplep.net/.	*Measures: Pre-post:* Depression-Anxiety-Stress scale 21 (DASS, Lovibond & Lovibond, 1995) ↔ (d = .50) Work Stress Measure (unpublished, taken from Bun Chan et al., 2000) ↔ (d = .19) Job Satisfaction (Warr et al., 1979) ↔ (d = .23) Work Commitment Questionnaire (Cohen, 1993) ↔ (d = .20) Work-related Self-efficacy (unpublished)↑ (d = 1.01) Eyberg Child Behaviour Inventory (ECBI; Eyberg & Ross, 1978). ↑ (ECBI problem, d = 1.1; ECBI intensity, d = 1.0) Parenting Scales (Arnold et al., 1993) ↑ (practices, d = .85) Problem Setting and Behaviour Checklist (Sanders & Woolley, 2001) ↑ (home efficacy, d = 1.1; work efficacy, d = 1.0) Social Support Scale (Marshall & Barnett, 1993) ↑ (d = .19) *Details:* Intervention and control improved significantly on 5 measures (above). *Measures at 4 month follow-up:* ↑ 8 Intervention group participants completed 4 month outcome data. Comparisons with post-test reveal significant improvement across all measures except social support. *Effect size:* (In parentheses above)

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Tamim et al. (2009)	*Design:* Pre-post-test design. Self-selected sample; first responders to a notice sent to staff union members. Outcomes assessed at baseline and 12 weeks. *Methods appraisal score: 4* [Individual criteria met: 1, 5, 7, 10] *Aim:* To examine the effects of Tai Chi program for improving psychological distress and musculoskeletal fitness among female University computer users. *Analyses:* Descriptive frequencies presented at baseline. Paired sample t-tests and Wilcoxon tests compared outcome measures (test values not presented).	*Setting:* *Toronto, Canada* *Participants:* Female employees from York University; first 52 responders from union list (N=250); Mean age: [of 46.1 (SD = 10.7), range (23-62)]; Education: [20 (38.5%) high school or some college; 32 (61.5%) were college graduate or above]; Married or partnered: [32 (61.5%)]; Ethnicity: [primarily Caucasian: 60.5% (N=26); Asian = 11.6%; south Asian = 18.6%; Black = 9.3%]; Average computer use = 5.8 hours per day. Job category: [reception = 9.8% (4); admin + 58.5% (24); data entry (9.8%); finance = (9.8%); other + 17.1% (7)]. At baseline, the majority of the participants (79%) perceived their physical fitness as average or above, 34.6% reported that they rarely or never engage in weekly physical activity.	*Intervention:* 12 week Tai chi program [Individual; single] *Content:* 2 x 50 min classes per week; delivered during lunch hour by professional TC practitioner; fitness tests by qualified personnel (no definition of 'professional' or qualified). *Inclusion / exclusion:* Only included: female employees on a Union subscriber list; first 52 responders; those using computer for 20 hours per week for last 5 years; those physically able to complete in exercise program.	*Response, Implementation and process outcomes:* Baseline response capped at n =52 (20.8%). Attrition: Attrition rate for intervention was 7/52 (13.5%; 3 for unrelated health reasons;3 personal reasons; 1 workload conflict) Attrition rate for exit fitness assessment was 9/52 (17.3%). Self-reported attendance was 19–24 classes (44.7%), 13–18 classes (47.4%), and 7–12 classes (7.9%). Motivation for participating in TC course assessed / reported (including for 92.3% of participants to improve overall health; 77% ease of accessibility; 75% to learn about TC). Perceived advantages and disadvantages of the intervention study were assessed with positive feedback on the location; makeup; timing and intensity of classes. The main reason provided for participating in the TC program was to improve overall health (92.3%) followed by easy accessibility of classes due to their being offered at workplace. *Funding:* Seed grant from the Centre of Research Expertise in the Prevention of Musculoskeletal Disorders (CRE-MSD) funded by the Workplace Safety and Insurance Board of Ontario.	*Measures Pre-post:* Perceived Stress Scale↑ *Physical measures:* Resting heart rate ↑; Waist circum. ↑; Musculoskeletal and back fitness scores ↑; Hand grips ↑; Sit and reach ↑; Blood Pressure ↔; BMI↔; Leg power ↔ *Details:* Participants in the Tai Chi program had significantly reduced post program scores on the Perceived Stress Scale and several musculoskeletal fitness outcomes. *Effect size:* [No test values reported. Pre-test mean = 26.1 (SD = 51); Post-test mean = 24.2 (SD = 4.5), p<.05]

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Anshel et al. (2010)	*Design:* Pre-post-test design, self –selected sample. All employees invited by email. Outcomes assessed prior to meeting with a mental health professional at the start of the program and at program end. *Methods appraisal score: 6* *[Individual criteria met: 1, 4, 6, 7, 9, 10]* *Aim:* To examine the effect of a 10-week wellness program on changes in physical fitness and mental psychological distress. *Analyses:* Separate Multivariate Mixed Model (MMM) analyses with repeated measures on the time factor (ie, pre- and post-intervention) were performed to examine the effect of the intervention; Univariate analyses. T tests & chi-squared tests compared PGWBI completers and non-completers on fitness measures, age and gender.	*Setting:* *South-eastern University, U.S.A.* *Participants:* 187 full time employees who participated in a campus employee wellness program; mean age ranged from 24-72 = 47.63 (SD = 9.97); 133 female, 54 male. Physical test results suggest that participants have an obese classification (mean body fat = 30.08%).	*Intervention:* DVM (Disconnected Values Model) based wellness program. [Individual; multiple] *Content:* Action research approach. 2 hour orientation/ seminar [participants assigned a fitness coach based on preferred gender, type of testing and workout schedule. Consultations with programs Life coach scheduled. Seminar held in classroom involved guidelines from the DVM with dvd, workbook, group interaction and lecture. Participants then identified negative habits impacting QOL with cost benefit consequence analysis, completed the Disconnected Values Inventory, and identified disconnects or inconsistencies.] Action plan then developed and agreed participant agreed to work with assigned coaches on implementation of plan. Participants met once per week with their fitness coach to receive exercise instruction, performance feedback, a review of “bad” habits participants wanted to change, and motivational messages. Participants met once with LSC for 30 minutes and discussed possible obstacles / ‘red flags’. LSC Provided optional bi-weekly group seminars on mental health. Educational materials were made available via a program website.	*Response, Implementation and process outcomes:* Attrition = 12% (23). 93 (56%) participants completed post-test psychological distress measures. Adherence for cardiovascular activity averaged 22 out of 30 sessions (73%), and strength training adherence averaged 13 out of 20 sessions (65%). Funded by President’s discretionary funds. Employees paid a supplemental fee of $25.00 to increase commitment and supplement costs. This included a program t-shirt, fitness testing, coaching, and free use of the campus fitness centre where all exercise testing and coaching was conducted. Fitness coach was a graduate student of the Exercise science program. Life skills coach (LSC) was a licensed Psychologist. LSC collected measures. Post-program feedback provided for 87 participants. For example, 39 respondents indicated the generation of new values and the subsequent commitment to living a lifestyle consistent with these values. Participants received baseline scores from which to improve, coaching, developed routines based on time management to schedule proper exercise protocol and other healthy habits, and reminders about the participant’s values, which coaches communicated to their participants regularly. *On-going?* No	*Measures:* Psychological General Psychological distress Index (PGWBI) ↑ *Psychological distress measures*↑*:* Multivariate *η*2 = .443 Anxiety η2 = .156 Depression η2 = .161 Positive η2 = .314 Control η2 = .149 Health η2 = .219 Vitality η2 = .381 *Fitness measures* ↑*:* Multivariate η2 = .650 Body fat η2 = .266 Vo2 max η2 = .393 Upper body η2 = .441 Lower body η2 = .447 *Details:* Significant time effect across all measures and significant pre to post improvement across all measures. *Effect size:* See above

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ **= worsening.**
Fritz & Sonnetag, (2006)	*Design:* Pre-post-test design. Participants recruited by email, sample self-selected, sampling method and procedure NR. Outcomes assessed at baseline 1 week before vacation (T1), during vacation (T2), within first 2 days after vacation (T3), 2 weeks after vacation (T4). *Methods appraisal score: 6* [Individual criteria met: 1, 6, 7, 8, 9, 10] *Aim:* To examine effects of vacation on psychological distress and performance-related outcomes. *Analyse:* Repeated measures analyses of variance; Hierarchical regressions. Statistical analyses/control for gender, age, having children, negative affectivity, vacation length, workload after vacation, vacation experience, performance related outcomes (resource consuming/providing). Distress (GHQ 12 scores) before the intervention were not a predictor of distress after.	*Setting:* German non-academic University employees, *Participants:* 85% female, mean age = 45.9 (SD = 8.92), mean job experience = 20.79 (SD = 11.10), 34% held University degree, average contract time pw = 29.04 hrs (SD = 11.65), 67% had at least one child. Initial sampling N was NR, survey sent to 414 employees who consented to participate and reported having at least 1 week vacation in following months, All 4 questionnaires (T1, T2, T3 and T4) provided and returned together.	*Intervention:* Vacation [Individual; single] *Content:* Minimum 1 week vacation. Uncontrolled format.	*Response, Implementation and process outcomes:* 233 questionnaires returned. Final sample due to missing data (N=12) was 221. The effect of workload after vacation (adapted from Karasek's, 1979 job demands scale) and vacation experiences were analysed. Resource consuming experiences (3 self-developed items for negative work reflection; non-work hassle (9 items adapted from Bolger et al., 1989). Resource-providing experiences related to: Positive work reflection (3 self-developed items); Relaxation experiences (3 self-developed items); mastery experiences (3 self-developed items). *On-going program?* Yes (Vacation)	*Measures:* Psychological distress (GHQ 12, Goldberg, 1978) ↑ *(η2=.34)* Burnout (Oldenburg Burnout Inventory, Demerouti et al., 2001) ↑: Exhaustion ↑ *(η2= .12)* Disengagement ↔ *(η2 = .02)* Task performance (5 items adapted from Williams & Anderson, 1991) ↔ *(η2 = .01)* Effort expenditure (3 items adapted from Earley et al., 1987) ↑ (=). *(η2 = .23)* *Details:* Burnout decreased after vacation and at 2 week follow-up. Psychological distress decreased after vacation but increased again 2 weeks later. Effort expenditure decreased (less perceived effort to complete tasks) immediately after and at 2 week follow up Negative work reflection during vacation predicted all wellbeing indicators immediately after vacation and some indicators 2 weeks after vacation. High levels of non-work hassles as well as higher levels of mastery experience significantly predicted exhaustion on return to work. Positive work reflection, mastery, relaxation, and non-work hassles were not significant contributors to distress at either time point.

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Goetzel et al. (1996)	*Design:* Pre-post-test design. Sample self-selected (Recruitment methods not specified). Outcomes assessed at baseline and between 1 and 5 years. *Methods appraisal score: 2* [Individual criteria met: 1, 10] *Aim:* To determine the effects of the Live for Life program on long term health improvements. *Analyses:* Health profile areas dichotomized into either "need" or "no need" to improve. Number of employees with a "need" to improve at baseline (at risk) compared to numbers at need at time 2 (using McNemar's x^2 test of significance of changes). Note: Test values and frequencies missing and were unable to be verified. Stated comparisons of attrition versus eligible sample reveal no differences (data not presented).	*Setting:* North Carolina, United States of America *Participants:* 15040 Duke University employees invited, baseline response = 4424 (29%). Study parameters adjusted to minimise follow up cost. Randomly selected 1868 (method NR) employees; following additional eligibility criteria N = 1540.	*Intervention:* Live for Life Program. [Individual; multiple] *Content:* The multi-element program included employee screening; lifestyle improvement programs such as smoking cessation, weight control, stress management, nutrition education, fitness, ergonomics, blood pressure intervention and targeted high risk programs, and an optional fitness club membership for $10 per month. Quarterly newsletter. Special events & challenges offered regularly. Quarterly newsletter; Special events, education, and action oriented challenges and contests offered regularly; Optional fitness club membership ($10) Inclusion criteria: Baseline measure completed; be randomly selected from baseline respondents; at least one year participation in the program.	*Response, Implementation and process outcomes:* Attrition was 48% (N = 738 unreachable at follow up). Program offered free of charge (fitness club $10 monthly fee). Employee screening conducted by registered nurse. Program sought to improve health, reduce medical care use and cost, absenteeism. 51% participated in at least 3 separate activities from 1989 to 1993. Inclusion criteria meant that only participants of the program for at least 1 year were followed up excluding any analysis of attrition drop-out and potential non-positive outcome assessment. *On-going program?* On-going (http://www.hr.duke.edu /about/departments/liveforlife/)	*Measures:* Health profile questionnaire (Johnson & Johnson): General psychological distress ↑ Stress management[7(unclr)] Weight Management ↓ Exercise ↑ Smoking cessation ↑ BP management ↓ Alcohol use management↑ Motor vehicle safety ↑ Nutrition/fat intake ↑ Blood cholesterol measures ↓ *Details:* At follow-up there was a significant reduction in the number of employees at risk on eight of the 11 measures. Weight management and Blood pressure management increased. Significant improvements in eight out of 11 health behaviours. *Effect size:*[8] -

[7] Conflicting results are presented regarding this measure and we were unable to verify information with Duke University. The authors state "With the exception of body weight, blood pressure and stress all other health-risk areas examined demonstrated significantly fewer high-risk employees at follow-up than at baseline (P<.05)." A significant improvement is subsequently identified (in figure 1, 37% at risk at T1 Vs. 34% at T2, p.341).

[8] Test values and N not available. Effect sizes were not calculated.

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Robertson et al., 2011	*Design:* Case study with descriptive evaluation. Stress risk questionnaire implemented in 2009 and again after interventions in 2010. Free gym utilisation measured at baseline (2010) (follow-up pending); for Fitbugs, outcome assessed at baseline and at end of trial (3 months). For stress management training, a 5 item feedback/evaluation assessed immediately post intervention only. *Aim:* To reduce the average sickness absence days lost per person per year due to stress; To increase overall staff satisfaction within the 'stress' category of the annual employee survey. ['The institution's insurers (AIG) highlighted stress management as an area for further development led the University to re-look at their existing stress policy and develop something to complement their ad-hoc approach to Health and Wellbeing Strategy.'] *Methods appraisal score: 2* [Individual criteria met: 1, 10] *Analyses:* No statistical analysis; descriptive presentation of percentage point change, uptake, and absence data.	*Setting:* Aberdeen, United Kingdom. *Participants:* University of Aberdeen employees (n = 4000); Baseline participant demographics not reported and response frequencies (N) not available for the stress risk assessment.	*Intervention:* [Individual; multiple] *Content:* Stress management briefings and training for managers and representative groups to raise awareness of HSE management standards, policies; outline the University's legal obligations; commence risk assessments as part of the staff survey. Delivered in half day course. 15 managers completed a pilot course which also included resilience training. Further training also carried out for 'stress advisers to be evaluated. Improvement groups set Improvement groups were established to discuss and develop action plans as a result of the staff satisfaction survey. Free off-peak gym membership A trial of 'Fitbugs' (N = 150, unrepresentative), a pedometer which provides motivational feedback via a personalised webpage (www.fitbug.com).	*Response, Implementation and process outcomes:* 13 item stress risk ques. developed in consultation with trade unions; questions reported to align with HSE's Stress management standards. No data available on psychometric properties; approach endorsed by HSE & Health and safety Committee as part of the overall stress management action plan. Intervention activities governed by a representative Health & psychological distress group. Funded by: HR budget; free gym membership initiative (cost: £105k) funded from an endowment earmarked for staff benefits; fitbug initiative [£4830 (£32.20 p.p.) funded from existing Healthy Working Lives budget]. User feedback: 78% rated stress management training as excellent. 82% of those surveyed post-training are more aware of the support available to staff (e.g. Occupational Health, Counselling, HR etc.) and 76% believe the resilience component of our training has enhanced their own ability to deal with stress. 65% felt more confident about being able to advise a colleague on stress if required to do so. Free gym offering informed by previous (Healthy working lives) findings. Improvements were made to the support available to staff, with awareness raising taking place through the College Forums. Equated to a reduction in stress related absence equating to £53.8K (£195.4K in	*Measures:* Stress risk assessment questions (via the annual staff survey) Sickness Absence data *Details:* 13 item Stress risk assessment. Favourable responses increased between 1 and 6% for twelve of the 13 items between 2009-10. Reduction from 2759 (10.4% of all absence due to stress/anxiety) in 2009 to 1956 (8.4%) in 2010. Average days lost per person due to stress/ anxiety reduced from 0.69 to 0.50. Free Gym utilisation: Uptake was 978 staff, averaging 16 visits per person.

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
				2009 v £141.6K in 2010). Mixed feedback from participants regarding Fitbugs (68% of 70 reported that they partly or full achieved their objectives; Participants stated that the trial encouraged them to; become fitter (66%), lose weight (28%) eat healthier (27%) and reduce stress (15%). 25% had not been encouraged to do anything; 62% would recommend to University community). *On-going?* -	

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Brun, Biron, & Ivers, 2008	*Design:* Prospective longitudinal case study of 3 projects with comparison group. Outcomes assessed before and 20 months after interventions beginning. *Methods appraisal score: 3* [Individual criteria met: 1, 7, 10] *Aim:* To record the intervention process and to evaluate the effectiveness of stress interventions. *Analyses:* Detailed analysis and description of process and implementation. Anova's; Spearman rank correlation coefficients were computed between exposure to risk factors and wellbeing indicators (i.e. social support, job satisfaction, intention to resign, psychosomatic symptoms and emotional exhaustion) after the interventions (T2). Groups compared on demographic (i.e. sex,	*Setting:* Quebec, Canada. *Participants:* Laval University employees, primarily female (68-85% depending on project), between 14-22 years of service; mean age 44- 48. Multiple actions and interventions introduced affecting different participant groups with exposure between 5% and 65% (Appendix 7). General actions affecting all staff as well as three primary projects are reported, one in an admin unit (N = 51), (Unit A), one in another admin unit (N = 160) staff (Unit B), one for all office staff (Project C, N = 456). Actions were short (3 months), medium, 6 months) or long term (12 months) in duration.	*Intervention:* [Individual-organisation; multiple interventions] *Content:* Information, training, and activities relating to return to work, work recognition, role clarification, work organisation, involvement in committees, social club, team meetings, physical environment improvements (due to the number of actions further detail presented in Appendix 7). Strategic action-research process. Comparison group exposed to general university-wide actions but not specific projects. Risk factors targeted by 55 actions in Unit A over 3, 6 or 12 month timescale. 16 actions in Unit B and 18 actions in Project C over a 6 month timescale.	*Response*[9] Unit A attrition = 53% [Baseline N= 41; follow-up N = 19] Unit B attrition = 37% [Baseline N = 124; follow-up N = 77] Project C attrition = 42% [Baseline N = 331; follow-up N = 191] Comparison Units attrition = 30% [Baseline N = 63; follow-up N = 44] *Implementation and process:* Interventions informed by previous 2001 research[10] showing high psychological distress, absence due to mental health issues, and identifying high risk psychosocial constraints. Pro Vice Chancellor of HR sets up working group to review situation & make recommendations. Permanent Psychological health committee set up (multi-representative, N=14) in 2002, has met monthly since 2003. This draws up policy, 3 yearly action plans with annual revisions, proposes analyses, action plans, & monitoring. Proposes pilot interventions.	*Measures Pre-post*[11]*:* Psychological distress (PSI) (Illfield, 1976) A: ↑; B: ↔; C: ↑; CG: ↔ Job satisfaction (Beach et al., 2005) A: ↑; B: ↑; C: ↔ ; CG: ↔ Intention to resign (O'Driscoll & Beehr, 200): A:↔; B:↑; C:↔; CG: ↔ Psychosomatic symptoms: (Illfield, 1978) A:↔; B:↔; C:↔; CG: ↔ Exhaustion (Blix, 1989): A:↔; B:↔; C: ↑ ; CG: ↔ Social support (Cohen & Hoberman, 1983) A: ↔; B: ↑ ; C: ↑; CG↔ Assessed reduction in levels of exposure to 16 risk

[9] Note: Conflicting response rates could not be verified (Table 5.1 in the report shows t1 response is N= 41; Table 5.4 states Unit A response was 51); [9] Biron, Brun, & Ivers (2008); [9] A= Unit A; B = Unit B; C = Project C; CG = Comparison group

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
	age, years of service) and psychological indicators (i.e. level of distress, satisfaction, intention to resign and exhaustion). Chi-squared tests, t tests, compared drop-outs with completers on age, sex, years of service and psychological indicators. Test values not provided.			Participants completed questionnaires and a series of interviews were held to identify problems and solutions in each unit. External consultant assists with focus groups and setting up committees. Meetings held with targeted employees (N= 87) in pilot projects over 3 stages to identify problems, solutions, validate information. Translation into action plans by committee; further consultation with employees. Study authors/research team observed, documented, monitored, and facilitated the design and implementation; conduct interviews (N=65) to assess process and identify obstacles/facilitators. Partnership agreement signed & training pre intervention coducted. $50 prizes randomly distributed to participants. Multiple intervention actions are reported by the study authors and the low exposure rates are evident (Appendix 7). Detailed description of process, obstacles and facilitators to process. Study financed by IRSST and the Department of Human Resources in Canada; Report translation financed by HSE UK. *On-going program?* No (Note: some actions reported as on-going).	psychosocial risk factors: Unit A: Medium or large effect size change in 12/16 risk factors; small changes in 2/16; no effect size change in 1/16 risk factors. Negative deterioration (small) in 1/16 risk factors. Unit B: Medium or large effect size change in 6/16 risk factors. Small effect size change in 8/16, negative deterioration (small) in 2/16 risk factors. Project C: Small effect size change in 5/16, no change in 7/16; negative deterioration (small) in 4/16 risk factors. Comparison groups: Medium or large effect size change in 1/16 risk factors. Small effect size change in 4/16, no change in 5; negative deterioration (small) in 6/16 risk factors. Reported exposure to interventions varied between 5% and 65% *Effect size:* In text

Study	Design, aim, methods appraisal, & analyses	Setting and participants	Intervention	Response / Implementation / process	Psychosocial outcomes and results ↑ = improvement ↔ = no change ↓ = worsening.
Davidson et al., (2010)	*Design:* Pre-post-test matched control trial. Outcomes assessed one month before the end of the semester before leaving for sabbatical, at T2 in the middle of the sabbatical, at T3 post-test in the middle of the semester following return from sabbatical (moderators measured once, during the sabbatical). *Methods appraisal score:3* [Individual criteria met: 1, 7, 10] *Aim:* To examine the impact of respite and resource gain on psychological distress. *Analyses:* Baseline analyses of differences (x^2); Pair X Condition X Occasion repeated-measures ANOVA test the hypothesis that the sabbatical and control groups differed in the amount of change across occasions; Authors computed three contrasts to test differences between the conditions in the amount of change from occasion to occasion; Simple-effects tests determined the significance of the differences between pairs of means; ANVCOVA's tested resources as mediator.	*Setting* Israel, New Zealand, U.S.A (author contacts informed choice of University sites). *Participants:* Faculty from 10 Universities in Israel (66%), New Zealand (21%), United States. (13%). For both groups the mean age was 56 and two thirds were male. Half were associate professors or senior lecturers, one third professors; remainder assistant professors or lecturers. Matched intervention group with control of same rank, seniority, sex and academic department (data NR). No differences on any measure or on any available demographic except tenure [(86% of the controls were tenured, in contrast to 94% of intervention [x^2 (1, *N* =124) = 5.33, *p*< .05)].	*Intervention:* Sabbatical leave. [Individual; Single] *Content:* Sabbatical (Defined as 'paid leave for personal and professional development' p. 954).	*Response, Implementation and process outcomes:* Estimated attrition[12] is between 72-85%. [15.7% (129 / 819) completed all 3 measures for intervention; 14.3% (129/900) for matched controls; 27% of intervention completed T2 measure (248)]. Resource levels across the occasions did not mediate the changes in faculty stress, but did mediate the changes in Burnout, Positive affect and Satisfaction. Significant moderator effects for respite quality, self-efficacy, control & detachment. Those with high respite self-efficacy experienced decreased burnout, increased resource gain and PA. Stress significantly lower only among those who reported more control. Stress and burnout were significantly lower among those who had detached during sabbatical. Higher resource gain in those who went abroad but also higher loss on return to work.	*Measures:* Faculty Stress Index (Gmelch et al., 1983 adapted by Keinan and Perlberg 1987): T1-T2↑; T2-T3↓; T1-T3↑ Maslach Burnout Inventory [exhaustion items (Schaufeli et al., 1996)]: T1-T2:↑; T2-T3:↓; T1-T3: ↔ Resources (adapted from Hobfoll & Lilly, 1993): T1-T2↑; T2-T3↓; T1-T3↔ Satisfaction with Life Scale (Diener et al., 1985); T1-T2↑; T2-T3↓; T1-T3↔ Positive Affect Scale (4 items from Watson et al., 1988 PA scale): T1-T2↑; T2-T3↓; T1-T3↔ *Details:* Significant positive improvements in Stress, burnout, and resources during sabbatical. Improvements declined again at return to work but Stress remained significantly lower than baseline. No change for matched controls on any measure except a decrease in satisfaction from T1-T3.

[12] Note: Exact flow of response for groups unclear and is based on those completing all 3 measures. Attrition likely to be accentuated due to matched pair design (i.e. loss in one group precludes entire pair from analysis). Analysis of moderators (intervention only) reported n as ranging between 236 & 247 [approx. 28.8%, (p.961)];

NR = not reported; job status refers to full-time or part-time employment; job type refers to academic or general employment status

Methods appraisal: 1 = prospective; 2 = representative sample; 3 = appropriate comparison group; 4 = baseline response .60%; 5 = follow-up .80% in cohort, .60% in cross-section; 6 = adjustment for non-response and drop-out;7 = conclusions substantiated by data; 8 = adjustment for confounders; 9 = all intervention group exposed, non-contaminated comparison group; 10 = appropriate statistical tests. Note: This review required studies to be evaluative assessments of change due to an intervention, therefore all studies were prospective. This research uses a commonly employed measure of effect size (for example, Field, 2005, p.32), Pearson's Correlation coefficient r, unless otherwise stated.

Appendix 25: Adjustment for confounders in intervention studies

	Hartfiel (2011) RCT	Martin et al. (2003) RCT	Sandstrom et al. (2009) RCT	Davison et al. (2010) CT	Tamim et al. (2009) P-P	Fritz & Sonneta g (2006) P-P	Goetzel et al., (1996) P-P	Brun et al. (2008) p-p-C	Robertson (2011) p-p	Anshel et al. (2010) P-P
Age	X	X B	X	X	X	√	X	X SNR	X	X
Gender	X	X B	n/a	X	X	√	X	X SNR	X	X
Education	X	X B	X	X	X	√	X	X	X	X
Ethnicity	X	X	X	X	X	X	X	X	X	X
Support	X	√	X	X	X	X	X	X SNR	X	X
Job description/rank	X	X B	X B	X B	X		X	X B	X	X
Drop out analysis	X	X SNR	X	X	X	-	X SNR	X SNR	X	√
Group Interaction	X	X	X	X	-	-	X	X	X	X
Previous treatment effects	X	X	X	X	X	-	X	X	X	X
Medical diagnoses / medication	X	X	X		X	X	X	X	X	X
Current activities	X	X	X	X	X	X	X	X	X	X
Years of experience	X	X	X	X	X	X	X	X SNR	X	X
Analysis of group differences on outcome measure at baseline	√	√	√		X	-	-	X SNR	X	X
Dependents	X	-	X		X	√	X	X	X	X

Adjustment for confounder (x = no; √ = yes) = refers to statistical adjustment / analysis of variable on outcome post intervention. B = Baseline statistical analyses of group differences according to this variable. RCT = Randomised controlled trial; CT = Controlled trial; P-P-C = Pre-Post study with comparison group; P-P = Pre-Post study; CS = Case Study. SNR = Stated but methods, analyses, or test values not fully reported; 'Having children' has been identified as a confounder in this group (Martin & Sanders, 2003); Group interaction refers to attempts to control or manage potential interaction between groups, deemed relevant in intervention setting where participants may have contact with each other , i.e. university colleagues. Medical diagnoses such as anxiety depression (for example, identified but not investigated in Sandstrom (2009). Dropout adjustment = refers to statistical analysis of dropouts. P = Partial analysis', if it was not possible to analyse dropouts who did not complete initial measures (e.g. Martin & Sanders, 2003 study); Note: Davidson et al (2010) state baseline comparisons of demographics but detail only presented for tenure variable.

Appendix 26: HSE Indicator tool Question by Question

HSE Indicator Tool - Question By Question

The results are grouped by stressor, and the average score is shown for each question associated with that stressor

Demands	Question	Average
	3 Different groups at work demand things from me that are hard to combine	2.85
	6 I have unachievable deadlines	3.30
	9 I have to work very intensively	2.46
	12 I have to neglect some tasks because I have too much to do	2.88
	16 I am unable to take sufficient breaks	3.52
	18 I am pressured to work long hours	3.41
	20 I have to work very fast	2.78
	22 I have unrealistic time pressures	3.32
Overall		3.06

Control	Question	Average
	2 I can decide when to take a break	4.14
	10 I have a say in my own work speed	3.51
	15 I have a choice in deciding how I do my work	3.73
	19 I have a choice in deciding what I do at work	3.31
	25 I have some say over the way I work	3.97
	30 My working time can be flexible	3.71
Overall		3.73

Managers' Support	Question	Average
	8 I am given supportive feedback on the work I do	3.06
	23 I can rely on my line manager to help me out with a work problem	3.50
	29 I can talk to my line manager about something that has upset or annoyed me about work	3.62
	33 I am supported through emotionally demanding work	3.01
	35 My line manager encourages me at work	3.37
Overall		3.31

Peer Support	Question	Average
	7 If work gets difficult, my colleagues will help me	3.61
	24 I get help and support I need from colleagues	3.88
	27 I receive the respect at work I deserve from my colleagues	3.81
	31 My colleagues are willing to listen to my work-related problems	3.76
Overall		3.71

Relationships	Question	Average
	5 I am subject to personal harassment in the form of unkind words or behaviour	4.06
	14 There is friction or anger between colleagues	3.30
	21 I am subject to bullying at work	4.44 *
	34 Relationships at work are strained	3.37
Overall		3.80

* '19 of your staff report that they are always, often or sometimes bullied.

Role	Question	Average
	1 I am clear what is expected of me at work	3.81
	4 I know how to go about getting my job done	4.01
	11 I am clear what my duties and responsibilities are	3.85
	13 I am clear about the goals and objectives for my department	3.80
	17 I understand how my work fits into the overall aim of the organisation	3.74
Overall		3.80

Change	Question	Average
	26 I have sufficient opportunities to question managers about change at work	3.14
	28 Staff are always consulted about change at work	2.46
	32 When changes are made at work, I am clear how they will work out in practice	2.79
Overall		2.80

Key
Doing very well - need to maintain performance. Represents those at, above or close to the 80th percentile*
Good, but need for improvement. Represents those better than average but not at, above or close to the 80th percentile*
Clear need for improvement. Represents those likely to be below average but not at, below or close to the 20th percentile*
Urgent action needed. Represents those at, below or close to the 20th percentile*

Appendix 27: Psychometric properties of the adapted CISS

Prior to performing PCA the suitability of data for factor analysis was assessed. Inspection of the correlation matrix showed the presence of coefficients of .3 and above. The Kaiser-Meyer-Oklin (1974) value was .722, and the Bartlett's test of sphericity reached statistical significance (p=.000), supporting the factorability of the correlation matrix. Selecting the number of factors to retain in Factor analysis is a controversial topic on which there is little agreement (O'Connor, 2000; Costello & Osborne, 2005). While the default and most common method is by Kaiser's criterion (to select those with eigenvalues over 1) this is 'among the least accurate methods' (Costello & Osborne, ibid., p. 2). Similarly, the inherent subjectivity in the interpretation of the scree plot may also be inaccurate.

The author explored several methods. Firstly the data was examined using Principal Component Analysis, and then the scree plot was examined, followed by parallel analysis and analysis of the component matrix. Results highlighted the inherent problems in selecting the number of factors and the importance of a multifaceted approach to interpretation. An exploratory approach using multiple techniques has been advocated in the literature.

Firstly, Principal Component Analysis revealed 7 components with eigenvalues exceeding 1, explaining 62% of the variance altogether. The majority of the variance (39%) was explained by three components.

Appendix 28. Principle Component Analysis (7 components)

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings				
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.622	19.258	19.258	4.622	19.258	19.258
2	2.526	10.524	29.783	2.526	10.524	29.783
3	2.222	9.258	39.040	2.222	9.258	39.040
4	1.716	7.151	46.191	1.716	7.151	46.191
5	1.516	6.318	52.509	1.516	6.318	52.509
6	1.223	5.096	57.605	1.223	5.096	57.605
7	1.074	4.475	62.080	1.074	4.475	62.080
8	.983	4.097	66.177			
9	.884	3.683	69.860			
10	.823	3.431	73.291			
11	.758	3.160	76.452			
12	.705	2.938	79.389			
13	.673	2.803	82.193			
14	.575	2.396	84.588			
15	.549	2.288	86.877			
16	.487	2.030	88.907			
17	.440	1.835	90.741			
18	.416	1.733	92.474			
19	.384	1.599	94.073			
20	.357	1.488	95.561			
21	.335	1.397	96.958			
22	.264	1.099	98.057			
23	.242	1.010	99.067			
24	.224	.933	100.000			

Secondly, analysis of the scree plot using Cattell's (1966) scree test suggested five components for further analysis. Figure 26 below indicates that interpretation is difficult as there appears to be a clear break or inflexion after the third factor and again after the fifth factor before reaching a more stable plateau.

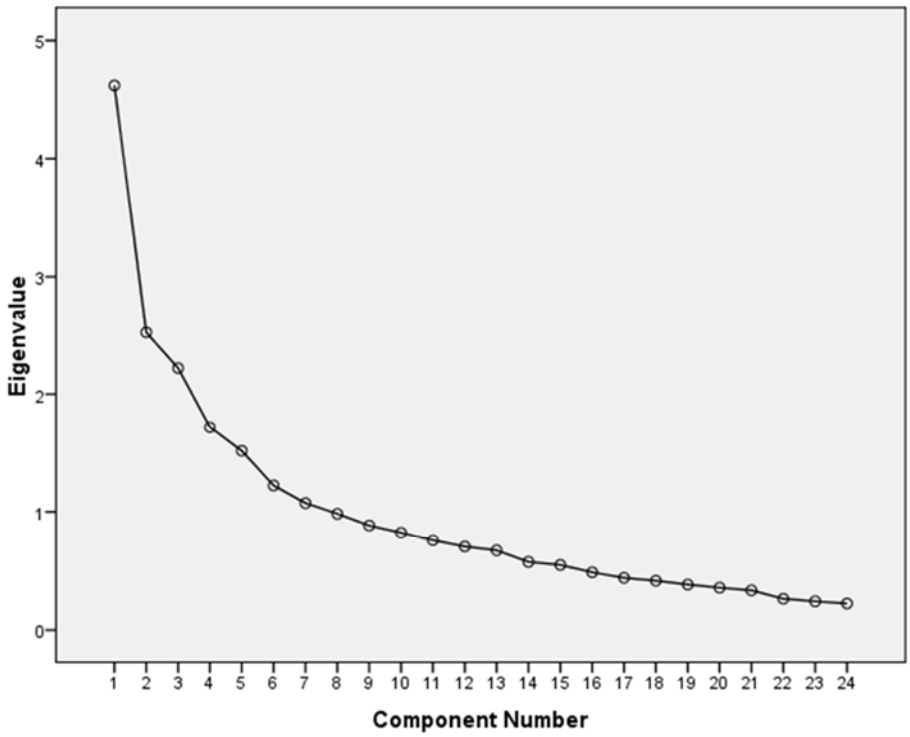


Figure 23. Scree plot CISS 24

Parallel analysis (Watkins, 2000) was then conducted using a software program called Monte Carlo PCA for Parallel Analysis (available from this website: http://www.allenandunwin.com/spss2/further.htm). The results (Table 9) showed five components with eigenvalues exceeding the corresponding criterion values, further supporting the retention of five components.

Appendix 29. Parallel Analysis

Component number	Actual eigenvalues from PCA	Criterion value from parallel analysis	Decision
1	4.622021	1.8258	Accept
2	2.525801	1.6817	Accept
3	2.221809	1.5757	Accept
4	1.716240	1.4926	Accept
5	1.516365	1.4152	Accept
6	1.222950	1.3431	Reject
7	1.074022	1.2676	Reject

At this point arguments could be made for retaining three or five components. While the majority of the variance seems to be explained by 3 factors the scree plot is inconclusive with either option looking appropriate. Similarly, the component matrix (Appendix 9) was unproductive. On consideration of the parallel analysis five factors were initially retained. To aid in the interpretation of these five components, orthogonal (varimax) rotation was performed.

There is debate over the cut-off point for suppressing factor loadings with .3 or .4 being most commonly used (Field, 2005; Stevens, 1992). While values less than .4 are not as substantive they are none the less likely to be significant. The author experimented with suppressing loadings at both .3 and .4 levels. Suppressing loadings less than .4 resulted in several variables without any loading (Appendix 10). Further examination of these variables suggested an acceptable fit within the factors they loaded on, and it was decided to re-analyse with a suppression level of .3 (Appendix 11).

Analysis of the Rotated Component matrix showed a considerable number of cross loadings and the five factor structure seemed unclear (Appendix 11). The analysis was

again conducted retaining three factors (Appendix 12 & 13). This solution revealed a much clearer picture with each factor showing a number of strong loadings (Appendix 13). These three factors supported the CISS subscales. Problem (14.9%) and Emotion (11.8%) items accounted for most of the variance. Interestingly, Avoidance items only explained 6%. Comparative figures of 16.2%, 12.4%, and 7.7% were obtained for the adult CISS norm sample. It is notable that 2 variables ('I take it out on others', typically an Emotion item, and 'I analyse the situation and the information available and think through the options', typically a Problem item) failed to show any loadings. This suggests that they could be removed from the questionnaire as they do not seem to contribute to the underlying factor structure. A third variable ('I think everything will be ok and don't worry'), typically an Avoidance item, did not load therein (but did load negatively in the Emotion factor) and was removed. A fourth variable typically considered an Avoidance item loaded on component 1 or the Problem component. This is perhaps not surprising when its content is considered ('I spend time with or talk to a special friend'). While talking with or spending time with others may represent an Avoidance strategy, it could just as easily represent an approach to problem solving and was therefore removed.

The analysis was conducted again without these 4 items. This revealed a clearer factor structure with no inappropriate cross loadings (Appendix 14). Within this solution one variable ('I try and take a break away from the situation') still failed to load on any factor so it was removed, and analysis repeated (Appendix 15). This led to what was considered the most appropriate solution, presented in Table 39 below, and containing 19 items (7 items represent Problem coping; 7 items represent Emotion coping; and 5 items represented Avoidance coping.)

Appendix 30. Final 19 items solution

Emotion-focused coping items	I become upset and feel ill
	I fall to pieces when faced with problems
	I feel anxious and worry that I am not able to cope
	I sometimes feel that problems are my own fault
	I take it out on others
	I feel tense when faced with a problem
	I get angry and upset
Problem-focused coping items	I focus on the problem and take positive action
	I learn from problems I have had to solve in the past
	I make a plan and put it into action
	I try extra hard to solve the problem
	I rise to the challenge
	I can generally cope with problems that arise
	I act to solve a problem the moment it arises
Avoidance-focused coping items	I watch television
	I treat myself to make me feel better
	I go out and visit friends
	I go to the cinema
	I go to bed and sleep

A reliability analysis demonstrated good internal consistency for the 7 Problem items (Cronbach's alpha coefficient of .81), and low internal consistency for the Emotion items (.504), and for the Avoidance items (.507). While these values are low, within short scales Palent (2005) states that "*it is common to find quite low Cronbach's alpha values (e.g. .5). In this case it may be more appropriate to report mean inter-item correlation for the items*" (p. 90). Examination of inter-item correlations showed that excepting one they all fell within the recommended range of .2 to .4 (Briggs and Cheek, 1986). It is suggested that the final 19 item solution to be the most appropriate. Future research seeking a shorter version of the CISS can adopt this 19 item version.

Appendix 31: Multiple regression Coefficient output

Coefficients[a]												
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
(Constant)	40.802	3.253		12.544	.000	34.367	47.238					
Demands	-1.105	.641	-.131	-1.724	.087	-2.373	.163	-.398	-.150	-.113	.742	1.348
Control	-1.794	.819	-.173	-2.191	.030	-3.414	-.174	-.439	-.189	-.143	.684	1.463
Mgr Support	-.562	.769	-.079	-.731	.466	-2.082	.959	-.502	-.064	-.048	.366	2.729
Peer Support	-.900	.837	-.095	-1.075	.285	-2.556	.757	-.456	-.094	-.070	.549	1.822
Relationships	-2.799	.812	-.333	-3.448	.001	-4.405	-1.192	-.602	-.290	-.226	.460	2.174
Role	.533	.847	.059	.630	.530	-1.143	2.210	-.424	.055	.041	.480	2.082
Change	-.883	.612	-.131	-1.442	.152	-2.094	.328	-.462	-.126	-.094	.523	1.911

a. Dependent Variable: GHQ